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INTERIOR WATER-WAYS FROM NEW YORK TO THE GULF COAST.

As a result of various meetings of her representative citizens and of a memorial to Select and Common Council Chambers from Mayor Stuart, the city fathers of Philadelphia have passed an ordinance appropriating ten thousand dollars for preliminary surveys, maps, etc., of the proposed enlargement of the Delaware and Raritan Canal; and this survey is now being made. All these preliminaries and the final appropriation were effected by the persistent efforts of Thomas Martindale, Esq., who has been for years an unselfish promoter of all kinds of municipal (Philadelphia) improvements.

On June 25 a mass meeting of prominent Baltimore and other Maryland citizens was held in Harris's Academy of Music in Baltimore. The meeting was under the auspices of the Baltimore City Council, and Mayor Latrobe presided. General Felix Agnus, of the *Baltimore American*, offered the following resolutions, which were unanimously adopted by the meeting.

Resolved, That the chairman of this meeting be authorized to appoint a permanent committee, consisting of twenty-one members, exclusive of the governor of Maryland and the mayor of Baltimore, and the presidents of the first and second branches of the City Council.

Resolved, That this committee shall be known as the Maryland and Delaware Ship Canal Committee, and that it shall take in hand the prompt and energetic promotion of the project, such as selecting the route and devising ways and means

whether they be national, State, city, or private enterprises; that this committee be strongly urged to organize at once and proceed with the work as soon and as expeditiously as possible.

The committee of twenty-one was appointed at that meeting, and on July 5, General Agnus, as chairman of this committee, appeared before the River and Harbor Committee of Congress, and asked for the appointment of a committee consisting of one army officer, an officer of the engineer corps, a naval officer, a citizen of Baltimore, and a citizen of Maryland; these gentlemen to select the best available course for the canal and report its choice to Congress. That the citizens of Baltimore and Maryland would then agree to furnish all the necessary funds for the completion of the enterprise. The plan does not contemplate the expenditure of any money by the government. Senator Gorman consented to have a paragraph inserted in the River and Harbor bill, providing for the appointment of the committee desired. Representative Catchings, chairman of the House River and Harbor Committee, also promised assistance.

At a meeting of the New York Board of Trade, on October 10, 1894, on motion of Mr. F. B. Thurber, the following resolutions were unanimously passed.

WHEREAS, The city of Philadelphia has appropriated ten thousand dollars to survey a route for a ship-canal between Philadelphia and New York, and this work is now in progress under the direction of a special committee created by the City Councils, of which the mayor of Philadelphia is president.

WHEREAS, This sum is inadequate to meet all the expenses incidental to the survey and publication of results, and whereas New York has even a greater interest than Philadelphia in thus improving our water-ways.

Resolved, That the city of New York should take similar action to that of Philadelphia, and appropriate an equal sum for the promotion of this great work.

Resolved, That if an enabling act of the Legislature is necessary to permit our city authorities to take such action, such a bill shall be prepared and introduced at once in the Assembly of the Legislature in January next.

Mr. Thurber said that he was informed that the city would have no power to make the proposed appropriation without authority from the Legislature, and hence the need of action by the State Legislature. He believed that the survey would demonstrate the practicability and benefit of the canal, and the desirability of its construction, if not by the government, then by private capital. On motion of Silas M. Giddings, it was ordered that President Darwin R. James should appoint a committee to carry the resolutions into effect. The president named Mr. Thurber, Mr. Giddings, and Charles H. Patrick.

It may not be uninteresting as a preliminary to refer briefly to the enormous amount of capital now or soon to be invested in canals in the United States and Europe.

The Clyde River, between Glasgow and the sea, was formerly a mere rivulet, so shallow that it could be waded in dry weather. The

Clyde Navigation Trust spent scores of millions in widening and deepening this stream. On January 1, 1894, the Manchester Ship Canal was formally opened. It is twice as wide as the Suez Canal; is in fact an extended dock. Its cost was $75,000,000. Railroad lines were elevated and carried over it on bridges; intersecting water-ways were lifted high in air, with extra locks and stupendous viaducts.

The city of Brussels has already a small canal connecting it with the sea. It is proposed to expend $10,000,000 in securing an average depth of twenty-two feet from city to sea in this bed.

France is considering two gigantic canal projects. A great canal is planned to extend from Bordeaux, on the Atlantic, across the narrow neck north of the Pyrenees, to Narbonne on the Mediterranean. It is to be three hundred and twenty-five miles long, from one hundred and twenty to two hundred feet wide, with a minimum uniform depth of twenty-seven feet. It is also proposed to dredge a deep passage from Paris in the bed of the river Seine, to the channel coast, at or near Havre.

In spite of financial straits, Greece opened, on August 6, 1894, a passage four miles long across the high and rocky Isthmus of Corinth. The *cut* of this canal is from one to two hundred feet deep, and a vast deal of heavy masonry has been needed to protect the walls. This enterprise cost $15,000,000.

Italy has also important canals in view,—one of them across the leg and the other across the foot of the Italian boot. The first of these is to begin near Rome on the west coast, and run one hundred and twenty-five miles in a northeasterly direction to the Adriatic Sea, at Fano. A depth of forty feet and a width of two hundred and seventy feet is proposed. The cost is estimated at $125,000,000. The other Italian project is that of a ship-canal twenty-four miles long across the province of Catanzaro, well down towards the toe of the geographical boot.

Sir Edward Watkin, M.P., in England, is talking of a direct route across Ireland by canal for transatlantic steamers bound for Liverpool. This project is coupled with the discussion of a tunnel between Scotland and Ireland. Sir Edward claims that both of these projects will cost together less than $100,000,000.

In the United States there is an appropriation of $50,000 before Congress for maps and surveys of a ship canal from tide water on the Hudson to Lake Erie,—to be as deep and wide as the Welland Canal. The same House committee which reported favorably on this project also recommended the survey of a canal from Toledo, or Cleveland, to the Ohio at Cincinnati. A survey of a canal to connect Lakes Erie and Michigan is also contemplated. There is also the proposed canal from Chicago to the Mississippi. The completion of this and of the

Nicaragua Canal would make Chicago a port commanding both western and eastern water traffic.

There is a measure now before Congress, passed by the House of Representatives and favorably reported by the committee of the Senate, —concealed under the modest title of "a bill to appropriate the sum of twenty-five thousand dollars, or as much thereof as may be necessary for the survey of a route for a ship-canal between the waters of Raritan Bay and the Delaware River." This is the initiative of a movement that will probably exert a tremendous influence upon the future commerce and defenses of the eastern sea-board of the United States, the project of connecting the waters of Raritan Bay with those of the Delaware River being but the first link in a proposed chain of interior water-ways which will ultimately reach the Gulf of Mexico, and thus join the Mississippi with the eastern sea-board by a safe, secure, and economic pathway.

This project is no new idea. It was broached as early as 1807 by Gallatin. Later (1842), the subject was investigated by John C. Calhoun, whose report on this topic is on file in the War Department. He advocated the plan when he was secretary in Monroe's cabinet. Mr. Calhoun pointed out that it would be a comparatively easy engineering feat to bisect the State of New Jersey from Raritan Bay to the ship channel of the Delaware River, thus making possible an inland water-way from New York to Philadelphia.

General Grant referred to the proposed canal in his second message to Congress, and Governor Beaver brought the subject before the Pennsylvania State Legislature during his term at Harrisburg.

The cities of New York and Philadelphia, ninety miles apart, are connected by two lines of railway, the Pennsylvania Railroad and the Royal Blue Line, having a total of six tracks. There is also the old Delaware and Raritan Canal, which is only navigable for canal boats of light draught, and which is leased to the Pennsylvania Railroad.

The traffic over these lines of communication is simply enormous, and growing so rapidly that the construction of the proposed ship-canal between the two cities would soon have been a necessity. Contiguous to the territory tributary to the canal is clustered nearly one-tenth of the entire population of the United States, the cities of Boston, New York, Brooklyn, New Brunswick, Trenton, Philadelphia, Wilmington, Baltimore, and Washington, being all linked together and within the sphere of its influence.

The wonderful development of these cities within the past five years, as concerns the building interest alone, strikes the observer with amazement. In the years 1887 to 1891, inclusive, there were erected in Philadelphia 42,170 buildings, at a total cost of $140,800,791; in Baltimore, 9659 buildings, costing $11,566,698; in New York, 17,997

buildings, at a cost of $315,120,630; in Boston, 9525, at a cost of $62,376,129. Brooklyn erected 20,111 buildings of one sort or another, at a cost of $98,270,531, while Washington spent $35,102,367 on construction during the same time. It will be seen that these six cities erected in five years over one hundred thousand buildings costing $663,737,126, or over $132,000,000 per annum.

It is reasonable to suppose that this gigantic march of building improvement will continue in the future. It is not in the nature of our energetic and restless population to engage in a great burst of speed and then subside until the spirit moves them again.

The railroads have been and are spending vast amounts of money to increase and perfect their facilities for handling the ever-increasing traffic imposed upon them. The Pennsylvania Railroad before it completes its improvements will have spent $12,000,000 between New Brunswick and Jersey City.

The Lehigh Valley Railroad is credited with having spent between five and ten millions to get into Jersey City. The Philadelphia and Reading Railroad has projected a new line from Bound Brook to tide water, and is spending nearly $5,000,000 in perfecting its terminal in Philadelphia. The Baltimore and Ohio spent $16,000,000 in the construction of its line from Baltimore to Philadelphia.

Now, to enable Southern and Western produce, and coal particularly, to be delivered more cheaply in New York, and to permit ocean steamers, coasting crafts, and government vessels of war more ready access to Philadelphia, it is proposed to enlarge the Delaware and Raritan Canal.

The present Delaware and Raritan Canal has been in operation for many years, and is leased to the Pennsylvania Railroad Company. The new and enlarged canal will start from the Raritan Bay at its head, cross the Raritan River about eight miles below New Brunswick, and enter the Delaware River at Bordentown. Eleven miles of its length will be an enlargement of the present canal. The other thirty-four miles will be an entirely original excavation. There will be a depth of twenty feet, a bottom width of ninety feet, and a surface width of one hundred and sixty feet. There will be two "opening locks" five hundred by sixty feet, and four "lift locks," with a total lift of fifty feet. The entire cost has been put at $12,500,000 by an expert. Fifty thousand dollars or more will be required to deepen the channel of the Delaware River between Philadelphia and Bordentown. If it is determined to afford passage for the warships of our navy, the depth of the canal will have to be increased to twenty-seven feet, which will increase the cost somewhat. The highest elevation to be encountered is seventy-six feet at Monmouth Junction. There are no engineering difficulties whatever in the way of the successful completion of the enterprise.

Without entering into an argument upon the cheapness of water transportation as compared with traffic by rail, and passing over the great commercial changes which have been accomplished by the aid of canals, notably the Sault Ste. Marie and Welland Canals in this country, and the Caledonian Canal in Scotland, the Suez Canal in Egypt, etc., it may be readily shown what advantages will accrue to New York, Brooklyn, and Jersey City in the transportation of coal alone.

These cities consume over six million tons of coal annually, and as it is calculated that a saving of fifty cents per ton will be realized in the cost of the haul from the mines to New York City, there will be at once a saving of $3,000,000 annually, or over twenty per cent. on the cost of the canal.

The advantages to Philadelphia would consist in affording a speedy exit to, and entrance from, the ocean, avoiding the long and tedious navigation of the Delaware River, shortening the time between Europe and that city, affording a secure harbor without extra cost by the utilization of New York Bay. And, as eighty-five per cent. of the foreign commerce of the port of Philadelphia is from the North, the canal would be in the direct line of travel for ocean-bound vessels as well as for an almost equal percentage of coastwise trade.

The strategic value of such a line of water-way in case of war cannot be overestimated. A hostile fleet off Sandy Hook could control the New York entrance and the Sound, and so do incalculable damage to the entire country by blockading its commercial and financial centre. The existence of the canal would place the waters *within* the blockade in direct communication with the principal naval depot of the United States government at League Island, and enable her cruisers to reach this point from New York in a few hours. The protection of our extensive coast line must depend more upon a floating armament than upon permanent forts. While this contingency is remote, the magnitude of the interests at stake render the relative cost of such a canal insignificant. The existence of the water-way would still further remove the possibility of such an emergency. The depth of twenty feet suggested for the channel would enable all the flotilla recently built to pass through by this canal. One cruiser, the "New York," drawing twenty-three feet three and one-half inches, and the battleships "Indiana" and "Massachusetts," each drawing twenty-four feet, could not pass through without slightly enlarging the canal prism. The distance from League Island to Raritan Bay would be only about *seventy miles* compared with say two hundred and thirty by the outside course,—a saving of one hundred and sixty miles.

Nor must the advantages to the territory traversed by the proposed canal be overlooked. About eighty per cent. of the distance is through unproductive swamp and lowland. The first effect will be to drain

the tract, and thus make the land tillable. Then will follow factories, potteries, brick-yards, marl-pits, villages, etc., and the desert will bloom and blossom as the rose.

The present Delaware and Chesapeake Canal was built in 1829, and enlarged in 1864. Its bonded indebtedness amounts to $2,600,000, and there is $2,000,000 of stock outstanding. The bonds are mainly held by the States of Pennsylvania, Delaware, and Maryland. The national government owns $1,000,000 of the stock. The canal proper is thirteen and a quarter miles long, and runs from Delaware City, on the Delaware River, to Chesapeake City, which is situated on an estuary of Chesapeake Bay. The depth of this canal is nine feet and its average width fifty feet. It is proposed to increase the depth to twenty-seven feet, and the surface width to one hundred and sixty feet. Professor Haupt, of the University of Pennsylvania, Mr. Thomas Martindale, of the Trades League of Philadelphia, and Mr. J. F. Price, the superintendent of the canal, traversed its length recently on a tour of inspection, and report no engineering obstacles, and a greatest elevation of seventy-six feet in the long *three-mile cut*. The cost of deepening and widening is placed at $2,500,000.

The Dismal Swamp Canal was formerly owned by a company of Norfolk and Baltimore capitalists, who, under the name of the Lake Drummond Canal and Water Company, lately succeeded the former owners, the old Dismal Swamp Canal Company. Still more recently new owners have purchased this artificial water-way at a cost of $14,000.

This Dismal Swamp Canal commences at Deep Creek, Norfolk County, Virginia, and extends in a southerly direction to South Mills, North Carolina, near the head waters of Pasquotank River, which empties into Albemarle Sound. Deep Creek is eight miles from Norfolk, and the canal is connected with the Elizabeth River, and the harbor of Norfolk by the Gilmerton Canal, three miles long, which has been excavated at no little expense to give the mother canal a straight line to Deep Creek. At South Mills the Dismal Swamp Canal is connected with Pasquotank River by Turner's Cut, about twenty miles from Elizabeth City, North Carolina (the objective point in making it), and a short branch "cut" connects it with historic Lake Drummond, Tom Moore's "Lake of the Dismal Swamp," by whose waters the canal is fed.

The canal proper is twenty-two miles long and sixty feet wide, and has five locks. It extends from deep water to deep water. Its depth at the northern terminus is fourteen feet, and at the southern terminus twelve feet. The ordinary depth is six feet nine inches, and it will accommodate vessels one hundred and fifty feet long, sixteen and a half feet beam, and drawing five feet of water.

A general enlargement is contemplated by its new owners. The depth is to be made nine or ten feet throughout. Locks two hundred and fifty feet long and forty feet wide are to be made at the ends, so that the average bay, sound, and river vessel can pass through without difficulty. Judging from analogy, it might be said that from four to five million dollars would cover the cost of widening this canal to one hundred and sixty feet, and deepening it to twenty-seven feet. The improvement of this water-way is important not only to facilitate traffic, but because contiguous to it, both in Virginia and in North Carolina, are to be found fine lands at present practically valueless. These would in all probability be settled and new communities be thus planted along the route.

The Albemarle and Chesapeake Canal connects the waters of the southern branch of the Elizabeth River, which has its mouth at Norfolk, with the North Landing River and Currituck Sound from Coanjock Bay to North River. This canal is fourteen miles long and eight feet deep, and has locks two hundred and fifty by twenty-four feet in size. Schooners as large as eight hundred tons have thus a course from Norfolk to the Neuse River by way of Albemarle, Croatan, and Pamlico Sounds, and by means of Clubfoot Creek, a navigable tributary of the Neuse, the Newberne and Beaufort Canal, Newport River, and the Bogue Sound, as far as the proposed line of the extension of inland navigation from the latter point to Cape Fear River. When the general government has properly improved this Clubfoot Creek, which is a tributary of the Neuse and Newport Rivers, the Atlantic may be reached at Byrne Inlet, a point on the coast thirty miles south of Cape Lookout.

The Newberne and Beaufort Canal is three miles long and has no locks.

From the Cape Fear River, streams, bays, passes, etc., already exist, through which Charleston, South Carolina, may be reached.

From Charleston to Fernandina, Florida, there has for long been a navigable channel. From Fernandina a canal is proposed across the neck of the Florida Peninsula to the Gulf Coast, and there is already an inside route all along the northern Gulf Coast to Mobile and New Orleans.

The strategic value of this inner highway of water in time of war cannot be overestimated. Should New York harbor and the Sound entrance be blockaded by a hostile fleet and effectually closed, the United States government ships of war would still have access to League Island, Newport News, Port Royal, and various important cities without once touching the ocean or even exposing themselves to attack.

With the projected completion of the Cape Cod Canal, Boston would also be connected with New York by an inside route. Six

years ago, when in command of the North Atlantic Squadron, Admiral Luce went from Philadelphia to Norfolk in the steam tender "Vixen." The "Cushing" has lately steamed from League Island to Raritan Bay. President Cleveland recently traversed the reaches of the Dismal Swamp Canal in a revenue cutter. Three years ago the revenue cutter "Morrill" showed that a vessel drawing nine feet of water and not over one hundred and fifty feet long might go from Charleston to Fernandina without touching the sea, except at one point.

We often read and hear of proposals to protect our eastern sea-shore cities by a system of forts capable of withstanding assaults from modern guns, carried by modern ironclads, the fortifications to be armed with the most improved and effective ordnance, and manned by a force sufficiently numerous to repel attacks. To carry out this plan would involve, according to the estimates of good engineers, in round numbers $100,000,000 for the construction of the works. To keep the defenses in repair, possibly a million dollars annually would hardly suffice. A further expenditure of three millions for rations and pay for the military employed would be necessary. And then we would have a plant producing no revenue whatever, but sure to require a very large outlay for expense. Contrast this with the sense of security and absolute protection the country would have were the "National Interior Water-way" completed. We could then readily seal up all our channels leading to the ocean so that the combined navies of the world would be powerless against us, and at the same time carry on our commerce to and fro within the boundaries of our magnificent country, without let or hinderance. We could live on and within ourselves for years without much inconvenience. No country in the world could so easily withstand a prolonged siege, provided this water-way was completed, as we could, and the cost of this whole national ship-canal would be much less than the figures we have given above for forts of stone, of brick, and of mortar, or of earth-works; not over $80,000,000 in all, and of that amount the government might not have to advance one dollar. If the government would guarantee three per cent. on bonds to the amount of $80,000,000, they would be promptly absorbed by capitalists. The traffic over the route would be so remunerative as to render it self-sustaining, if not from the start, at least within a very short period from its completion. What is now an immense tract of waste, swamp, and marsh land would acquire value as if by magic; railroads would build lateral lines to tap the canal. The topography, hygienic conditions, and material wealth of the whole region would be improved.

Surveys have been made over the whole extent of the water-ways, and Congressional reports have appeared on it. Ten years ago a commission consisting of one navy and two army officers made a thorough survey. Here is a chance for an absolutely solid investment of

the funds of the national government, an investment which will yield a triple return in interest,—dollars and cents,—national development, and national safety. Philadelphia, Baltimore, New York, Boston, and Norfolk have already joined hands to start the good work, and have buried all municipal jealousy in a united desire to foster the best interests of the greatest number. "Quickness and safety in transit are always economy, whatever the cost" is the watch-word of the maritime genius of the age.

S. MILLINGTON MILLER, M.D.

RURAL TRADITIONS.

ALL agricultural communities from days of earliest record to the present time have by reason of their rustic surroundings, admitting of quiet contemplation not possible for people engaged in commercial or manufacturing pursuits, been close observers of natural phenomena and natural life. From these contemplations they have deduced theories, some correct, others very erroneous, all, however, handed down from age to age, among an illiterate peasantry or among others of moderate education, certainly of unscientific attainments. The vast expanse of sky and atmosphere, which country-folks enjoy, affords them free scope for the study of natural objects, and the peaceful surroundings an opportunity for observation of the ways of animal and vegetable life, leading the mind of even savages to form a code of reasoning. City men, having little opportunity to make such observations, must look for folk-lore entirely among people of the rural districts and their descendants.

One of the most common rural traditions, yet believed by millions of people, is that pertaining to the sowing of seed as influenced under the varying phases of the moon, the belief being universal among ignorant peasantry that seeds of plants which develop above the earth's surface, as grain, vines, shrubs, and trees, should only be planted when the moon is new and growing in size, while seeds of plants which grow beneath the earth's surface, as turnips, beets, carrots, should be planted when the moon is going down or declining. The same ridiculous idea, with variations, is carried into many other operations of country life, as, for instance, that beef or other meat should always be killed during the *increase* of the moon, that it may grow heavier after the killing, while if butchered during the *decrease* of the moon, it never stops shrinking and losing weight. This silly tradition has been handed down among the ignorant peasantry of nearly all nations, and even in our own land of public schools it is this day believed by thousands of rural folks, many of whom should know better.

As an example of superstition among the intelligent, the writer was told by a commissioner of agriculture of the United States, in office since 1870, that he believed wheat should always be sown during the increase of the moon, and that a fence should always be set while the

moon was decreasing, else it would not set firmly; that if set under any other phase of the moon, particularly if a worm fence, it would not stand over three years.

A lunar superstition of wide belief to this day is that the moon holds water; that when a young moon stands erect or nearly on one horn, the weather will be wet, as the water will certainly be continuously running out; but if the moon lay on its back, it will hold water like a basin, and the month be dry. Again: It is thought to be a good sign to see the old moon in the arms of the new; it is believed to indicate peacefulness; but a new moon on a Sunday is bad for the rest of the month.

Sheep-shearing, it was believed by the ancients, should only be done during the young of the moon, and men who had their hair cut in the last quarter were certain to go bald. Something of this kind is yet prevalent among the people of the present age. Lumbermen very generally believe the sap of trees rises and falls with the lunar variations.

In Scotland, whenever possible, the more ignorant class of peasants strive to enter their own or other houses to which they wish good luck by approaching the door in the line of the course of the moon.

Among old-fashioned country people, in this country, it is a general belief that shingle roofs should only be put on when the moon is on the decline, otherwise they believe the shingles will curl upward and the nails be drawn.

In many sections, simple-minded country-folks take special care on the nights of the new moon to go out and look at it from such a standpoint as will bring the moon over their right shoulder. If by accident they should first see it over the left shoulder, they believe they are fixed for a streak of bad luck for thirty days. Farmers in the West and many in the East profess to believe in the story of the ground-hog, the tradition being that if this little animal comes out of his hibernating hole the second day of February and sees his shadow at noon reflected by the sun from an unclouded sky, he returns for three weeks, being too wise to be so caught, a promise of good weather on that day being too much to be believed even by a ground-hog.

In the Middle States, some of the country people have a belief that the kind of winter to expect is indicated by the style of construction of the houses of muskrats, large structures portraying a long-continued series of cold weather; small houses the reverse. The Indians believe the same as respects the houses of beavers and martins. Another infallible sign of a hard winter in the lore of country-folks is a bountiful crop of holly, cedar, and other wild berries. This, however, simply indicates to a close observer that by the fortuitous condition of the previous winter the blossom-buds passed uninjured, the result being a large crop of berries; but as it often happens that a mild winter is

succeeded by a very severe one, unthinking people believe in some preternatural influence. Hosts of ignorant people in various parts of the United States place reliance upon the autumnal marking on the breast-bone of a goose as indicating the kind of weather to follow, believing that if the bone is pure white the winter will be mild, but if it is specked or much covered with brown patches, the winter will be severe,—the intensity of the cold being indicated by the amount of discoloration.

The period or time for commencing many farming operations in olden times was indicated by weather-signs; for instance, hop-pickers should always begin their work before the September winds set in, as such winds were certain to extract all the virtue from the hops. This is entirely an old English idea transplanted to this country.

The mistletoe, with the holly and the ivy, was used by the pagan nations, especially the Druids, in their religious ceremonies, but by the early Christian Church was condemned and forbidden, so tainted was it with paganism. Now the churches have ceased to so regard it, and, with the holly and laurel, it occupies a prominent place on Christmas and other festive occasions. The mistletoe was doubly sacred when it grew on the oak, and so many medicinal qualities were ascribed to it that it was called "all heal." While the mistletoe was intimately connected with many superstitions of the British and German Druids, the Celts believed it to have wonderful magical virtues. A relic of the early significance of the plant is the custom of licensed kissing of girls and women when caught under its branches. What this indicated is not definitely known, but it is believed to have been connected with a license not consistent with the ideas of a more chaste age. While the mistletoe is less beautiful than the holly or laurel, it seems to have fastened itself in the affections of the people of England and their descendants much as it attaches itself to the branches of trees.

The ancients attributed all sorts of preternatural religious and medicinal powers to plants. Bundles of flowers covered the tables of the Greeks, and were worn during repasts, not so much for beauty, but because the plants from which they were taken were supposed to possess virtues of preserving the wearer from the effects of wine; also of preserving the faculties, of preserving purity of ideas and gayety of spirits.

In the midland countries of England to this day old country-folks burn in early spring a branch of thorn in the wheat-field to prevent smut, and preserve the half-burned branch to light the fire for the succeeding year, the same as the yule-log was preserved in households.

The divining-rod was formerly numbered as one of the most general superstitions among country people throughout the world, and

in some parts to this day. Some employed branches of the peach, others willow, apple, and ash, but the hazel was always the favorite. According to the rules, the branch must be cut under the first new moon after the winter solstice, and must be double or forked in the form of a Y. It must be held by the extremities of the two arms, the main stem projected in front of the breast of the operator. Properly cut and properly held, providing the operator be a medium, it will, it is claimed by believers, point to water and to valuable minerals by bending downward. The best results are generally attained by the seventh son of a seventh son. While working the rod, the following words must be spoken:

> "Divining Wand, do thou keep the power
> Which God gave unto thee the first hour."

So magical was the divining-rod in the estimation of some people that it was used for drawing off evil spirits, even taken into the harvest-fields and waved over grain stocks. It had the reputation of guarding against shrinkage, ratage, and other injuries.

There is a tradition among the Italians that the root of the peony is possessed of strange medicinal powers, but it must be dug at night at a certain stage of the moon; but if an owl fly near the digger while he is procuring the plant or root, its miraculous power vanishes at once.

Many rustic folk believe it is bad luck to sow parsley-seed, and still worse to dig up the roots. The same superstition obtains with respect to the willow-tree. The writer, while decorating an old place in Virginia, with the aid of some negroes, could not persuade one of them out of many to plant some willows, and was obliged to do the work himself. They looked upon the willow as a graveyard tree.

Among the early Pennsylvania Germans it was considered bad luck to take eggs from a nest after sunset, or for the farmer to sell after dark, and this in some quarters is still believed; and among the same people honey-bees were always taken into the confidence of the early settlers on matters of births, marriages, and deaths, the housewife going at high noon to the hive, tapping three times with the house-key and very quietly informing the bees of the event; if not so informed, they are likely to leave the hive in high dudgeon.

To this day in Pennsylvania, in some country districts, even so close as is Bucks County, so firm is the impression that Friday is an unlucky day that farmers will not commence an operation of planting, sowing, or reaping on that day. Should it be necessary to have a field plowed on Friday, they will turn a furrow on Thursday night, so that the work may have been commenced before Friday.

On Good Friday morning German peasants used to, and possibly yet, go into the orchards and invite God to make their trees fruitful, but on Good Friday evening they scourged the trees which were un-

fruitful the season before. In Devonshire it is yet considered bad luck to plant anything upon a Good Friday.

The negroes of the South are full of superstitions connected with agricultural practice. One most firmly established in their minds is that no one can plant seed so successfully as a pregnant woman; consequently such women are in demand and are sent for many miles, making quite a profit by hiring their services. The negroes in Virginia have a saying respecting corn-planting that "if you plant in May the corn will weigh, but that if you plant in June the corn will rue,"—that is, the corn will be soft, and in the autumn the coons will eat it.

In Germany and in the German districts of Pennsylvania it was formerly considered the best practice to plant beans upon Ascension-Day. German peasants in some districts have a practice of invoking the assistance of the Deity early in spring, making the occasion a general feast, and, indeed, at all times during the seasons of sowing they practice certain religious rites. If unable to get the assistance of a priest, they officiate themselves, and to this day these rites are continued by some of the Pennsylvania Dutch.

Among dairy people in the German districts of Pennsylvania, it was customary, not many years back, when butter would not form in winter, for the operator to put into the churn a well-worn horseshoe to drive out the witches. If the horseshoe did not drive out the evil spirit, the operator next put in a pinch of salt, and at the same time a pinch into the fire, repeating this alternately nine times; the last operation, and the one other considered efficacious, was to lash the cream with a switch of mountain ash or hazel.

In Yorkshire it was once believed among country-folk that to meet a white horse grazing on the road-side when starting forth to a market-town with farm-produce forbode low prices, but that this evil might be avoided by vigorously spitting so long as the white horse was in sight.

Snake-skins among the ignorant have always had a superstitious reference, one of the beliefs being that the house in which snake-skins are hung are insured against destruction by fire. The Mennonites to this day never set hens when the wind blows from the east, believing that a large portion of eggs will prove to be defective. A very common tradition among country-folk is that to kill a toad will cause bloody milk in cows. This is a saying evidently designed to prevent boys from cruelty. The four-leaved clover has a superstitious reverence among the peasantry of every Christian country. Its form, resembling that of a cross, is considered a safeguard against evil spirits.

Signs have always occupied a prominent place in the folk-lore of ignorant rustics. For instance, roses and violets blooming in winter

indicated a plague or pestilence, and a sickly season being sure to follow. In Scotland a fog in February is claimed to be indicative of a frost in the corresponding day in June, and it is a common saying among the Scots that if the 25th of March, first Mary's day, is without rain, then second Mary's day, 25th of December, will be wet, or *vice versa*.

Among the Dunkards of Pennsylvania the first lamb seen in the spring will indicate fortune for the year; as, if the head is turned towards the observer, plenty is in store for him; but if the hind quarters are first seen, his expectations of profit will always be vanishing in the air.

It is a tradition that when one sees on the street a woman with red hair, he can at the same time in the vicinity see a white horse; and it seems generally the case, ridiculous as the statement may appear. A red-haired person is considered born to good luck, as the devil keeps away from red hair.

Some years ago, country people, especially those of Scotch descent, tied red cords or cloth around the tails of their cattle sent to pasture to keep off witches, and old women wore red rags on their fingers. Horses sent from rural districts to the city for sale generally, to this day, have their tails bound up with red cloth. Why not blue? Because red is a mystical color, and because it is the custom, and it has become the custom because it was mystical. All the world over ignorant people to this day have the same regard for red as a safeguard against evil spirits, and it is with this idea that holly, thorn, and red-berry trees and shrubs came into use on gala occasions, because of this supposed magical quality.

In England, ash-trees and hazels have the reputation of keeping off witches, and on this account numbers of these trees are seen in proximity to the dwelling-houses of country-folk of the laboring class.

Among many of the Dunkards of Pennsylvania is a practice to this day, when taking a calf from its mother, to move it from the stable tail first, in which case they claim the cow will not fret after it; but to make assurance doubly sure, they back the mother out of the stable before the calf is taken away, then remove the calf tail foremost and return the mother. If under any circumstances the cow should not be easy, a few hairs of the tail of the calf, placed in her right ear, will certainly soothe her. The Pennsylvania Dutch believe that if a cow has twins, one a male and the other a female, the latter is necessarily sterile, and such are always sold to the butcher.

Even in this age the old belief that wheat will turn to chess or cheat is prevalent in many localities. Cheat is also known as darnel, a grass having by its appearance gained for it in some localities the name of rye-grass. This plant, unnoticed among the wheat plants in the autumn,—more hardy than the grain itself,—grows luxuriantly, and

sometimes, after crops of wheat have been partly winter-killed, appears to have assumed the place of the wheat, appears to be a reversion of the grain sown.

The Romans believed, and the tradition is yet common among the peasants of France, that caterpillars and squash-bugs could be driven from the garden if a bare-footed woman, with her hair down her back, would, before sunrise, walk three times around each vine, but later on, on no account should a woman be admitted into the garden when the fruit was as much as half ripe, as her curiosity would tempt her to handle the fruit and likely stop its growth.

Another early tradition, handed down from the days of Virgil, is that beans should be pulled before daylight to make them proof against injury by rats.

Not many years ago the country people of some parts of England on the twelfth day after Christmas took pots of cider with baked apples into their orchards and sprinkled the most fruitful trees, addressing them in endearing terms to continue productive, reciting, among other forms, the words, "Health to thee; good apple-tree, continue to bear pocketfuls, hatfuls, peckfuls, bushelfuls, bagfuls, cartfuls." Something similar is the practice in Bohemia, the peasants going into the orchards before sunrise on Good Friday, and, falling upon their knees, exclaiming, "I pray, O green tree, that God may make thee good," and on Good Friday they run in circles round the trees crying, "Bud, O trees, bud, or I'll flog thee."

In Ireland the peasantry make a cross in the air as a safety against evil consequences upon the passage of a magpie, often even taking off their hats. American tourists follow the example as a matter of fun, but the simple native does it with a religious devotion.

An ancient and very common custom among country-folk, and still practiced in some districts, when building a new house, is to put some coins in the linings of the house that they always may have money in the house.

In Germany the onion is considered a very lucky vegetable, and is commonly hung on the houses where there are contagious diseases, even hung up before the disease appears, as a preventive. The writer, some years ago when inspecting a large farm in Essex, England, saw, upon going to the stable, suspended from the beams many curious hangings, and upon inquiring was told that they were bags containing onions, a sure preventive against cattle-diseases, the onion absorbing and retaining whatever poisons might be floating in the air, or be exhaled from the animals; the proprietor, an intelligent man, professed to believe in the practice.

Not many years ago Welch children with whooping-cough were frequently passed under the belly of a donkey as a curative measure; at other times passed through a cleft tree, an ash preferred, the tree

cleft through the trunk, and kept open by wedges, thus forming an orifice sufficiently large for the passage of the child. Trees can to this day be seen showing the wounds received while undergoing this operation.

To cure eye styes it was believed by many that a hair from the tail of a black cat rubbed upon the eye would, after the first moon, dry up the stye and prevent the return of others. Also, a double hazel-nut was a sure preventive against toothache, and a horse-chestnut, carried in the pocket, was believed to be a sure safeguard against rheumatism.

The Germans in Pennsylvania were much given to using boneset tea. If it was desired to act as an *emetic*, the leaves were stripped with an upward motion along the stalk; but if a *cathartic* was required, they should be stripped downward. On no condition must the leaves be mixed or, the tea made from the mixture would produce most disastrous results.

Certain ignorant farmers yet believe in a diseased condition of horned cattle which they term hollow horn, and to cure it they bore a small hole into the horn and squirt some of the cow's milk into it with a syringe. Veterinary surgeons will all explain that the condition known as hollow horn is simply a result of a cold, and requires the same treatment.

In Norfolk, England, where ague prevails, an early method of cure was for the patient to be taken to a cross-road where there was an oak-tree, his head placed close against the bark, and a lock of his hair driven into a hole bored into the tree, and then fastened by a tight-fitting plug; this done, the patient was directed to tear himself away, and proceed home without looking behind, but if by chance he should look backward, the charm was dispelled. It was claimed that erysipelas could be cured by wearing in a silk bag around the neck the body of a frog from which the right leg and left forearm had been cut off. Most diseases, it was claimed, could be warded off by carrying the tongue of a fox in a silk pouch resting upon the breast, so long as its merit be not extinguished by the passage across the path of the wearer of a live fox.

The peasantry of Yorkshire, England, have a tradition that to sleep on a bed stuffed with hawk and game-cock feathers extended the duration of life, but to use dove feathers was sacrilegious. The story is told of a very ill Yorkshire man who, seeming to die slowly and painfully, was taken out of bed and laid on the bare floor; when, according to the story, he died immediately and quite easy; upon examination it was found the bed was stuffed with game-cock feathers.

BURNET LANDRETH.

LORD WOLSELEY'S "MARLBOROUGH." [1]

"It often seems to me as if history was like a child's box of letters, with which we can spell any word we please. We have only to pick out such letters as we want, arrange them as we like, and say nothing about those which do not suit our purpose." [2]

WHEN the most brilliant of our living historians threw off that bitter sentence about the work to which he has devoted his life, was he by chance thinking of the "glorious Revolution of 1688," the reigns of James II. and William III.? It is at all events certain that whoever follows Lord Macaulay in examining the original sources for the history of those reigns, on which he has employed his fascinating pen, finds himself beset with difficulties because of the freedom with which the great Whig historian has exercised his undoubted prerogative to take what he likes, reject what he likes, and so make the materials he has selected tell what tale he pleases. There are few characters which have been drawn with such masterly power as those of Macaulay's William III. and Macaulay's Marlborough. There the men stand. No! It would be more true to say that they live and move and have their being among us as they did, nearly forty years ago, among the generation for which they were created. Not only in his brilliant volumes do they still exercise their power over us. The shorter historians—as, for example, Mr. J. R. Green—have been content to transfer to their own pages sketches drawn from those finished portraits. Dean Milman, in the sketch of Macaulay's career prefixed to the posthumous volume of the History, tells us that the book was written with the design of making "romance surrender up the province it had usurped." It's success in that respect is beyond dispute. The eight volumes are as delightful reading as even "Quentin Durward." Only it may be doubted whether in the course of the struggle the novelist and the historian have not changed weapons. The Louis XI. and Charles the Bold of Scott are the most accurate historical portraits that have ever been drawn of these two men. Powerful, on the other hand, as those two creations of a master-mind, our hero king and our

[1] Reprinted from the *London Quarterly Review* by permission of the Leonard Scott Publishing Company, New York, the American Publishers of *Quarterly Review*.

[2] Froude's "Science of History" in "Short Studies of Great Subjects."

traitor general, undoubtedly are, suspicions of their historical veracity must have often haunted those who have merely studied the great historian himself.

Taking no account of the innumerable facts which have been ingeniously if not very ingenuously omitted, in order to leave without a blot the stainless character of the hero, one illustration at least of the use of materials for the companion portraits of him and of Marlborough is frankly shown us. The man whose phlegmatic and un-English character had made him, great as he undoubtedly was, always unpopular in England till one of the most popular of Englishmen undertook his apotheosis, had left behind him a series of letters to his intimate friend Bentinck. From these, and avowedly from these alone, his panegyrist contrived to show that the king's inner character was full of those heartier and warmer qualities of which duty and policy restrained the exhibition to the world. The villain of the piece, the foil to the great hero, had also left behind him a series of letters, glowing with warm, simple, and hearty love for the dowerless girl whom he chose for his wife, for the termagant shrew to whom, through good and evil fortune, from the moment he married her, he remained absolutely faithful. By an ingenious sneer the fact that Marlborough "loved but one only, and held fast to her," is made to add an element of weakness to his character. By an immediate introduction of the great advantage which in after-life Marlborough enjoyed from the influence of Sarah over Queen Anne, a suggestion too ludicrous to be sustained by the most unscrupulous slanderer if gravely stated, is slipped into the reader's mind that, after all, Churchill's love-match was based at bottom on as sordid a calculation as any that the meanest of mankind ever made.

The wrong from which Mary suffered during the earliest years of her married life is so used as to make it appear that when, by the surrender to William of her rights to the crown, and by the assurance of her absolute submission in all political as in all other affairs to him, she had secured his tolerance, she had actually gained that for which she, then ten years wedded, so pathetically sued,—his love. Her touching letters of almost slavish devotion to him, the wording of which often suggests her having met with brutal indifference, or with sneers or scoldings that cut her to the quick, are made to prove the generosity of the husband who could inspire such devotion. Prudently none of them are given. Not a hint escapes of that letter of Mary's in which even she—who during all her long married widowhood never allowed one word of reproach to trouble her hero, for the neglect under which she pined, for the faithlessness which she knew only too bitterly—lets slip the phrase that, because of the neglect of her husband, she had in her very prime lived the life of a nun. In direct contradiction of all evidence the hero is said to have at least had the

decency to conceal his amour. The story is swept out of sight by a furious attack upon the "spies and talebearers" who conveyed information of it to Mary. "Spies and talebearers!" when the intrigue was carried on with one of Mary's suite under her very eyes, when it was so public that Anne had the rashness to reproach Portland for the way in which Elizabeth Villiers gloried in her shame before Mary's face, when the huge gifts of lands which were made to the mistress out of James II.'s estate became a matter of Parliamentary remonstrance!

These evidences of the freedom with which the great historian has selected his materials are, we say, patent to any one who examines for himself the story as it is told by him. Nevertheless it is not too much to assert that the readers of Macaulay are now divided into two great classes,—those who have examined the original evidence on which his story is based, and those who are content to abandon themselves to the charm of his writing and the eloquent torrent of his invective. The popularity of the history as a work of art is hardly less than it ever was. Throughout society, in proportion as it is influenced by those who know the truth, skepticism as to Macaulay's treatment of facts is everywhere rampant. The "New Atalantis" and "The Dear Bargain" are works that are only to be found by some research and to be read only in a few libraries. The connection between those scurrilous pamphlets and the most popular of English historians is therefore only to be traced by the few. To those of us who have made the comparison, a physiological problem of no small interest is presented. What is certain is that Macaulay has, consciously or unconsciously, transferred to his own pages charges against Marlborough which he can only have taken from pamphlets, the writers of which he has himself denounced as "habitual liars" (vol. iv. page 579, edition of 1855). In one notable instance,—that of the muster-rolls after the battle of Walcourt, which Macaulay accuses Marlborough of having fraudulently caused to be made up,—the charge is taken from a pamphlet in which James II. is spoken of as "a lover of his people, an encourager of trade, a desirer of true liberty to tender consciences," a "hater of all injustice, and a true father to his country."

Apparently Macaulay's marvelous memory had this peculiarity, that while the materials he had gathered from all sources were in his well-ordered mind so arranged as always to bring the phrase he required, or the fact he wished to use, to the tip of his pen for the purpose for which he proposed to use them, the source from which they came was at the moment a matter of no importance. That this tendency has permeated his whole history was exhaustively demonstrated shortly before his death by a writer who warmly appreciated the great qualities of the man whose lapses he exposed. Mr. Paget, the author of "Paradoxes and Puzzles," which is throughout a careful examina-

tion of Macaulay's facts and of the authorities on which they are based, was a strong Liberal. "It was not without many a hard struggle," as he confesses, that he found himself compelled by a dry examination of facts to admit that he had been grossly deceived and misled by the man whom he profoundly admired. So exhaustive is the analysis to which he has subjected Macaulay's allegations on many points that it is safe to say that any one who, in our time, supposes that Macaulay has habitually stated historical facts accurately or interpreted them justly has never studied Mr. Paget's work. All who, like Mr. Leslie Stephen, or Mr. Saintsbury, have dealt with the materials of this period, have confirmed the soundness of Mr. Paget's conclusions. Yet there are still many caterers for popular audiences, to whom "Paradoxes and Puzzles" is an unknown book and Macaulay remains as an accepted "authority."

Any one, therefore, who attempts in our day to write a life of Marlborough is faced at once by the difficulty that the biography is inextricably involved in the political events of his time, and that his part in those events has been already recorded by an authority whose design was not to weigh them with a just weight in an even balance, but, playing the part of artist and not of arbitrator, to make a telling picture by throwing all the light upon one of the great actors in the drama, all the blackness on the other. Nor is the difficulty lessened by the fact that Marlborough's character is not one that can be defended after the fashion of Lediard or of Coxe. Blots that can never be removed rest upon it. Exposed to a storm of slander in which everything that he had done was twisted so as to appear merely and only evil, he himself, except when he was legally challenged, preserved silence, while his widow, irritated almost to madness, rushed into defense of him and of herself in language which in itself repels any reader who would wish to render her and her husband justice. It is time that we should at least know the truth about a man who, whether for good or evil, played one of the most conspicuous parts in all English history. We therefore rejoice that Lord Wolseley has undertaken the task of going carefully into the evidence on which the life of the victor of Blenheim, as we at present know it, is based.

It was in the circumstances inevitable that Lord Wolseley should restate much that was already, in its main outline, sufficiently familiar. Without such a restatement the actual part that Marlborough played in history cannot be judged. At almost every point he has matter to bring forward that puts a different complexion upon the facts. His task has perhaps been somewhat lightened by Mr. Leslie Stephen's admirable sketch of Marlborough's career, which has already, so far as space would permit, exposed some of the more extravagant absurdities of Macaulay's estimate of Marlborough, and has supplied some of the most important points that had been omitted. Lord Wolseley's fuller

statement, based entirely upon original investigation, pursues its course without reference to the established theory, except in a few instances where the statement of the charge usually made against Marlborough is necessary in order to set forth the facts. It introduces one all-important element which Mr. Stephen has hardly touched, and which, briefly stated, amounts to this. During the reigns of William III. and Anne, Marlborough stood very much in the position formerly occupied by Warwick as "king-maker"; and from this point of view, and not as a private citizen, his motives, his actions, his temptations, and his conduct generally, must be judged. Now, Mr. Oman[3] has shown that, largely as personal ambition and intrigue entered into Warwick's career, he was yet, at nearly every period of his shifting course, the representative of popular feeling and the agent in behalf of what at least seemed to him the interests of the kingdom. It is clear that in any just estimate of Marlborough this fact, if established, has to be seriously taken into account.

It must be remembered that that part of Marlborough's career which precedes the great campaigns in Flanders extends over a period equal to the whole life of William. Though, in judging of him as a man, there are important questions to be discussed in regard to his conduct during the time when he was the central figure, not in England only but in Europe, yet it is safe to say that when he has reached fifty-two years of age a man's character is fixed. It is the history of the first fifty-two years of Marlborough's life which has been most inadequately recorded. It is to this period that the two volumes now published of the Life are devoted. Lord Wolseley has in fact undertaken to show cause why, at least so far as regards one of the chief actors in it, the history of the "glorious Revolution" should be read in a new and different light. He makes no attempt to defend the actions of Marlborough in all their details; but he is able to prove that many of the charges against him are without foundation, and that the determining motives of his conduct have been falsely judged according to the clearest rules of evidence. We may occasionally find ourselves unable to accept all the conclusions at which he has arrived. But no one can fail to realize the energy with which he has sought for all available data, and the value of the result in making clear many facts which had been previously obscured either by the blindness of hate or the carelessness of insufficient research.

We must pass rapidly over the earlier years, though we by no means undervalue the interest of Lord Wolseley's elaborate treatment of them. John Churchill's father, Winston Churchill, was a cavalier who had lost all in the cause of the king. John Churchill was born on May 26 (O. S.), 1650, at a time when Winston Churchill had taken refuge in Ash House, near Axminster, which belonged to his wife's

[3] In his volume of the "Men of Action" series.

Puritan mother, Lady Drake. In that house he was educated chiefly by his father, a well-read but somewhat pedantic man, with the assistance of a neighboring rector; afterwards he spent a year in the Dublin City Free School, and about two years at St. Paul's. At the Restoration the cavalier's services were rewarded by the appointment of both himself and his children to various positions about the court. John Churchill became page to James, then Duke of York. Arabella, his sister, joined the duchess's household, and for a short time became the duke's mistress; but, as he soon discarded her and she subsequently married, there is nothing to show that John Churchill's advancement was specially due to her influence. In any case, in that most dissolute court there were few, if any, young men who would have resented such a relation for their sisters. Parents sought for such places both at Versailles and St. James's. Nor was it strange that a very handsome young man, most fascinating in his manners, should, in such an atmosphere, plunge into an intrigue with a distant connection of his own, the Duchess of Cleveland, a thoroughly abandoned woman, and certainly the temptress. It is probable that he received money from her; apparently, according to her own statement, not as her lover, but for certain services presumably connected with the concealment of her vices. It was a disgusting period of our history, at least as it presented itself at court. There were in the land men who held themselves as loftily above its standard as any have done at any time. Nevertheless, one may venture to think that even at a later date Fielding had no intention of representing his hero as plunging into more than the ordinary vices of youth. When Thackeray introduces Colonel Newcome as speaking with contempt passing beyond words for "that fellow" Tom Jones, because he did very much what at this time young Churchill did, he imports a different standard of morality from that in which Churchill lived at the court. The question of the standard of those among whom he lived is important, because, though Churchill never pretended, as he says himself, "to be a saint," there is no reason to think for a moment that any of his court life made him give himself up as abandoned to do wrong. There is no reason to assume that his appeal, in his later letters, to "good men" to judge his subsequent transactions, was not a genuine one. When his letters appear to show that in positions of great difficulty he chose what he believed to be the right course of action, there is no excuse, because of his early life, for treating them as therefore hypocritical.

In many respects he was far superior in morals to the crowd around him. He neither drank nor gambled. Naturally, the fact that his father had been beggared by taking the side of the king during the civil war made money a pressing necessity for Churchill. It was surely a virtue, not a vice, that, having no money to spend, instead of running into debt, he acquired the habit of careful economy. That

such a habit formed in youth is hardly ever afterwards shaken off, and degenerates into niggardliness long after there is no need for saving, is one of the commonest experiences of life. We all know instances of it. They are not attractive, certainly, but we might as well praise or blame trees for throwing out their leaves in spring as complain of the wealthy Duke of Marlborough for blowing out a superfluous candle, because John Churchill, if he was to be honest, had to stint himself in rush-lights.

Lord Wolseley has cleared up the doubtful points about the parentage of Sarah Jennings. Even the painstaking biographer of the "Queens of England" had declared that nothing was known of Sarah's father, and that her mother was an infamous woman. The early circumstances of Abigail Hill, due to family misfortune, all the particulars of which Lord Wolseley has recorded, were used by Miss Strickland as evidence that Sarah herself rose from the dregs of society. Lord Wolseley has shown that the language about Mrs. Jennings is baseless scandal, and that she was much respected in her own county of Hertfordshire. She was, however, like her daughter, almost insane in the violence of her temper. Both Sarah's father and mother belonged to old county families. Her great-grandfather, Sir John Jennings, appears to have become insane; so that Sarah's lineage gave fair promise of that mad temper for which she was justly famous. It is not impossible that the marvelous patience and endurance with which Marlborough habitually dealt with her, may have been in part due to a knowledge of the danger of altogether overturning the balance of her mind. At all events, the way in which, after she has had one of her raging fits, he habitually writes to her, as if he were alone to blame, is suggestive of some such caution. In Marlborough's letters there are not a few passages which are positively comic in their effect; in these he begs her pardon for his "bad temper," having, by the admission of all his enemies, one of the sweetest and most genial of tempers; she, by the avowal of all her friends, the temper of a tigress.

Lord Wolseley has brought out, with a fullness which has never been attempted before, the nature of Churchill's military services in France under Turenne. He was already a colonel at the time he married Sarah. The general effect of the ample details which Lord Wolseley has given of Churchill's life during the reign of Charles II. shows that he rendered most valuable services to his master, and that he remained absolutely loyal to him during all that long period when the ultimate exclusion of James appeared to be as certain as any future event. Almost, however, at the very moment when James mounted the throne, Churchill took care to give him a warning through a man who was sure, as he well knew, at once to repeat the conversation to the king. Whilst he was himself employed as envoy extraordinary to the Court of France, in order to report to Louis XIV. the accession of

James, Churchill said to Lord Galway, "If the king should attempt to change our religion, I will instantly quit his service." Lord Macaulay has taken pains to establish the authority of Bishop Burnet on a higher footing than we are disposed to accord it. Nevertheless, Burnet makes that very important statement, and not a hint of it is given by the historian. In order to realize its significance, it must be remembered that no king ever ascended the English throne with a better chance, if he had only used common prudence, of exercising despotic power than James. This point has, we think, been brought out with irresistible force by Mr. Brewer in his essays on the Stewarts, which were originally contributed to these pages.

After careful study of the ground over which the campaign against Monmouth was fought, Lord Wolseley has, largely from local sources and county chronicles, written a narrative of those operations which naturally gains much interest from his military knowledge and criticism. But our present purpose is to take advantage of the fresh materials which Lord Wolseley has collected, in order, by comparing them with others, "to bring" before our readers, as he puts it, "the man John Churchill," though we do not bind ourselves simply to sketch from the portrait which he has drawn. We shall, therefore, not attempt to follow him through the Sedgemoor operations, which are in their main outlines sufficiently familiar. The one fact which concerns us is that he has shown clearly that Churchill's services in that campaign were not merely very important, as both Macaulay and Green admit that they were. The effect of the campaign was to give him an authority, position, and influence in the army such as at that time no other man possessed or approached. Neither Peterborough nor Talmash had as yet made themselves famous.

The next fact that has to be taken into account is the profound disgust which was excited in Lord Churchill's mind by the fiendish cruelties of James and Judge Jeffreys during "the bloody assize." Churchill's words, "I wish well to your suit with all my heart, but do not flatter yourself with hopes. This marble is not harder than the king's heart," are of course quoted by all historians; but, introduced as they are with phrases about him such as Jeffreys would have used to prejudice the trial of a prisoner, they are never weighed as indications which show how these events tended to determine his subsequent action. In the autumn of 1687, whilst Churchill was still a prime favorite, James asked him what the people thought of his having caused Romish priests to perform the religious rites connected with the ceremonies for "touching for the king's evil." "Why, truly," Churchill replied, "they show very little liking to it; and it is the general voice of your people that your Majesty is paving the way for the introduction of Popery:" and again, in reply to James, he added, "What I spoke, sir, proceeded purely from my zeal for your Majesty's service,

which I prefer above all things next to that of God, and I humbly beseech your Majesty to believe no subject in your three kingdoms would venture further than I would to purchase your favor and liking: but I have been bred a Protestant, and intend to live and die in that communion; that above nine parts in ten of the whole people are of the same persuasion, and I fear (which excess of duty makes me say), from the genius of the English nation and their natural aversion to the Roman Catholic worship, some consequences which I dare not so much as name, and which it creates a horror in me to think of." The king replied by an assertion of his absolute claim to be obeyed, and afterwards at dinner, without speaking to Churchill, treated him to a conversation solely intended to enforce the duty of passive obedience.

The plot between the English noblemen and William took overt form about the beginning of 1688. Churchill seems not to have been privy to their councils, but it is hardly likely that it was long before he was aware that something was brewing. In any case the reckless course of arbitrary tyranny on which James had entered, and the public excitement about it, must have early forced on him the question what line he ought to take. After the Monmouth campaign he held no military appointment under James till William had landed. Anne was in continual correspondence with her sister at the Hague, and through her Mary seems to have received the first hint that the Churchills were resenting as keenly as any in the land the conduct of the king. Mary had taken a great dislike to Sarah during a visit which Anne and Sarah had together paid to the court of William. Without having in any way modified her dislike, she as a matter of policy wrote to Sarah letters full of expressions of friendship and assurances of her delight in the affection which existed between her sister Anne and Sarah.

Tried by any ordinary rules, it is difficult to imagine anything more basely treacherous than the action of both the sisters Mary and Anne. Nor is it possible to imagine that any single actor employed an agency for the deception of his father-in-law more diabolical than that which was used by William. Mary under his control continued up to the very time of the sailing of the expedition to write affectionate letters to her father. On one point in particular her letters are masterpieces of deceitful phrasing. For some time after the Prince of Wales was born, no news of the suspicions about his birth reached the Hague. Accordingly he was, as a matter of course, prayed for in Mary's chapel. When, partly from Anne and partly from Zulestein, Mary and William became aware of the universal belief that no Prince of Wales had been born, but that a fictitious child had been substituted in order to deprive Mary of her rights to the succession, the prayers were stopped. The doubts about the birth became one of the strongest points in the declaration which William was preparing to issue. Yet,

in order to delude her father, Mary appealed in her latest letter to the fact that the prince had been prayed for at the Hague *before* he had been prayed for in England, as a proof that any casual omission of his name in the prayers had no significance which need cause the king anxiety. Nevertheless, we are by no means disposed to judge harshly the actions at this crisis of either William, Anne, or Mary. If this were the time to deal with the question, we think that there would be little difficulty in proving that a deliberate design upon the English crown had been formed by William at a period at least as early as that of the ascendency of Shaftesbury; that the severe discipline to which he subjected Mary was designed not only to make her his obedient tool, but to prepare her to ascend the throne of England to the exclusion of her father on the death of her uncle; and that from the time of his marriage he worked steadily to gain his ends. Nevertheless, it is easy, as has been shown by an advocate who leaves nothing in that matter to be desired, to account for the general course of his conduct in a way which places it far above any efforts of mere sordid ambition. That a girl of sixteen, taken from her father at a much earlier age with the express design that she should, under skillful instruction be taught to hate his creed, married to a man able completely to master her, and surrounded by those who looked upon her husband as the hero of Europe, should learn to submit herself absolutely to her lord, and to think it a sacred duty to aid him against her father, is in accordance with all that we might expect. It is the story of the Janissaries. It is the story of the grandson of the victor of Ivry. What availed it to the victorious Huguenots to shout their

"Glory to our sovereign liege King Henry of Navarre,"

when that grandson, educated to look on them as hateful rebels and heretics, was to use the power, which they had put into the hands of his grandsire, so shamefully against their descendants as to convert even the Pope, as the popular phrase ran, into a "Protestant" against his cruelty?

In using that analogy we have touched upon what seems to us one at least of the central facts that have to be realized, if we would judge justly the conduct of either William, Mary, Anne, or Marlborough. Every historian necessarily alludes to the dragonnades and the revocation of the Edict of Nantes. No historian, as it seems to us, estimates at its due weight the effect of the frightful crimes which accompanied them in determining the conduct of the chief actors in the "glorious Revolution." Few things are more difficult than to transport ourselves into the life and conditions of a society which flourished two centuries ago. There is no period of which we have such elaborate details of court and town life from contemporaries; but to put us in a

position to understand the feelings of the people, the influences under which they acted, the extent to which the movements on the surface of society affected the great mass of the nation, at a time when distances were for all practical purposes so enormously greater than they now are, these details are not enough. Neither Pepys nor Evelyn gives us sufficient light to enable us without effort to see things as our ancestors saw them, and to feel as they felt.

The faculty of putting ourselves in the place of others is more particularly required in dealing with the charges which are made against the clergy of the English Church, the Tories, and the cavaliers for their inconsistency in resisting the efforts of James to introduce a creed hateful to them, when many of the same men had been pressing to its utmost limit a theory of Divine right and a doctrine of non-resistance. But in order that we should have even the bare materials for realizing the influences which were acting on the men of 1688, and, as we shall show presently, more directly upon Marlborough than upon any other man of his time, there is need of a much more ample narrative of the appalling incidents of the dragonnades than has ever been told in England. Probably the materials which exist at this moment for such a work in Bethnal Green are fuller even than those that are to be found in the house of many a Protestant *pasteur* in Paris or the French provinces. Miss Strickland, careful as she was in her search for original documents, has missed the whole point, when she says that the cruelties were no greater than those carried out in many a year by the Inquisition. As a reason why the loyalist members of the English Church should have sat still while James was fastening the yoke about their necks, perhaps the argument lacks something of completeness. The imposition of the Inquisition was in England connected with the hated rule of Mary Tudor and of Philip II., in Spain with the utter decadence into which that unfortunate country had fallen, in Holland with the name of Alva and the rise of the republic itself. But at least the iniquities of the Inquisition represented a genuine and even popular belief, that no tortures of the present could be other than charitable inflictions if they saved the victims from the endless pangs of the hereafter. The illegality of even judicial torture was at that time almost as much a peculiarity of England as the absence of the dueling code is in our day. It did not extend even to Scotland. It was possible for large-minded Englishmen, however much they might hate the work of the familiars of the Inquisition, to realize that the civilized world was against them in that matter. Cruelties as great had been inflicted by Protestants in Holland and in Scotland. But the action of the priests of France in directing the soldiery of the Grand Monarque in the households of the most cultivated, the most intelligent, the most sober, the most industrious, the most godly families of the kingdom, admits of no such excuses.

It would be a gruesome task to set forth the full horror of these doings. But in order that their nature at least may be understood, we will cite two cases of a kind which we believe to be representative, the truth of which appears to be established beyond cavil. It matters little for our present purpose whether they did occur or not. What is certain is that the fugitives who succeeded in vast numbers in escaping from these devilries, despite every effort that could be made by the government to drive them back into the shambles, carried into every English, Dutch, and German town where their language could be interpreted, stories of sufferings which, as narrated by them, were not likely to lose in the telling. It was then, if we are to believe the records, no uncommon incident, in the houses where parties of soldiery, rioting from morning till night and from night till morning in the very bedrooms to which their victims, the master and mistress, were confined, and encouraged in their drunken revels by the superintending priest, in order that no sleep might be allowed to husband or wife,—it was no uncommon incident for a baby to be taken from its mother's breast and secured just out of her reach till she abjured her faith or listened to the dying cries of her starving little one. The edict which permitted all the children of recalcitrant Protestants to be taken from them and educated in convents or nunneries was by a specious interpretation made to apply to young women of marriageable age, who being skilled embroideresses would be useful slaves in a nunnery, even if they could not be made to accept the creed of their mistresses. In one instance at least it is recorded that the pious nuns, having failed by every cruelty they could inflict in shaking the faith of their pupils, invited the officers of a neighboring garrison town to come over to see young ladies of the society in which they moved stripped and savagely whipped by these patterns of modesty and purity.

Nor, though these refinements of cruelty, which were unknown to a coarser age, are the special characteristics of the dragonnades, were the more savage forms of torture less than in those more brutal times. Mary at the Hague was full of indignation at the story of a fire having been lighted under two young Protestant girls in France, and whatever Mary heard reached Anne, and through her the Churchills. Now, the feeling of the cavalier and the Tory for his king was essentially religious. What effect then upon the clergy, the country gentry, and the leaders of English life must these stories have had? "Torture we can understand if we cannot excuse it. But these priests! these nuns! are they who thus play with the love of a mother and the modesty of a young girl the representatives of the religion you would force on us? Is it our duty to God to place our daughters in the hands of these?" What logic would not go to the winds before such questions? Is it right, is it fair to say that the English Church had preached passive obedience till it thought it would be applied to itself, and approved of

it only as long as it could be used against Whigs and Roundheads? Is it right to ignore the effect which would be produced on any father or mother by such tales as these, told by those who had with difficulty saved their own children from such crimes? Churchill knew France well and spoke French fluently, so that he probably heard more of these crimes than almost any one.

Lord Wolseley accepts the statement that James congratulated Louis XIV. on the Revocation. The evidence is conflicting. He probably both privately congratulated him and publicly protested. He as ostentatiously as possible gave shelter and money to the refugees, for which they were abundantly grateful. What effect on the confidence in him of any man in England could such acts produce? The bloody assize and Judge Jeffreys told every one only too plainly what was to be expected from him if William were defeated.

No man in all England knew better the marble of that heart than Churchill. And now, whilst unemployed, there comes before him the question, not merely "Shall I put my daughters and my wife in the hands of this man, of these priests and these nuns?" but this: "William can muster only some twelve thousand men. James can easily muster forty thousand. Intensely Protestant as is the feeling of the English soldiery, they will, if properly led, fight well enough for their lawful king against invading Dutchmen. Feversham, as he has shown clearly enough at Sedgemoor, cannot lead them. Had I not been there, James's army would have been defeated. Monmouth would now be king. Shall I make myself responsible not merely for another bloody assize, but for English dragonnades, or rather—for James knows his English soldiery too well to attempt that—for the greater horror of Irish dragonnades in England, with Tyrconnel for chief inquisitor?" Churchill is at this time by education, training, and habit a Tory of the Tories, a cavalier of the cavaliers: he has had no scruple in carrying out instructions from his king for negotiations with France which few can have loathed more than he did. Bred a courtier, surrounded by the air of the court, nothing else was to be expected of him. He has all his life been in the habit of giving wise advice to James, to which, in the days of adversity, his master not unfrequently listened. Now he knows that he has no power to move the king towards any moderation. Taking into account his all-powerful influence over Anne, and the difference that it will make to the fighting efficiency of the army which side he chooses, he must feel that with him rests the decision whether he shall or shall not fasten on England a reign not merely of tyranny, but of cruelty. Is it wonderful that, in these circumstances, puzzled by the alternatives before him, he should make up his mind to talk over the matter with a friend, and should abide by his decision?

The choice of the "discreet and learned minister of God's word"

to whom, in accordance with the directions of his church, he under these circumstances "opened his grief," was at once the most natural and one of the most significant he could have made. Turner, then bishop of Ely, had been with him as chaplain to James when Duke of York, and was his own personal friend. They had been together all through the long exile in Scotland, during the years of the "Popish plot" and the Exclusion Bill. The bosom friend of the saintly Ken, Turner was not the man in whom an unscrupulous plotter would have been likely to confide. He was as much attached to James as Churchill was. He had remained chaplain deliberately after James had become an avowed Roman Catholic. He had preached a "passive obedience" sermon at the Coronation. He was soon to be one of the five bishops who showed at least that no worldly motive determined their conduct, when they were sent to the Tower as a consequence of their protesting against the illegality of James's conduct, and were afterwards deprived because they could not conscientiously approve of his deposition. On this occasion he gave no hesitating answer to Churchill. He told him that "it would be rebellion against God if he sided with those who sought to destroy the civil and religious rights of the people, and that to refuse assistance to those who 'came to the help of the Lord against the mighty' would be to incur the curse pronounced against Meroz."

The wording of the advice exactly represents the position of Turner as of Churchill. It is worth considering carefully, because it is clear that Churchill's action was determined by it, at the moment limited by it, and afterwards affected by it. Like all the other Tories who entered into communication with William, Churchill never offered to support him in claiming the crown. He was probably, like the rest, content to allow events to determine the future; but, for the moment, his letters to William, and his words when he is actually in William's camp, as reported by Clarendon—no friendly witness—are consistent in this: that he is ready "to shed the last drop of his blood" for King James and for his *lawful* rights, but that William may command him absolutely in his efforts in defense of the Protestant faith, and, though this is by no means so prominent, in asserting the ancient liberties of the kingdom. On William's landing, Churchill is summoned to attend James. He is made a lieutenant-general and given command of a brigade. He is already pledged, to such extent as we have seen, to William. To refuse to go to James is to disclose the whole plot, to make it certain that William's invasion will fail. He goes. James, when he hears that Cornbury has deserted, assembles his officers, and begs any of them who wish to desert him to resign their commissions. We think that it is fair, from what James reports, to infer that what Grafton and Churchill answered was precisely what Churchill wrote to James afterwards, and what had in all probability

been carefully determined on beforehand as the language that should be used in such an emergency,—viz., that they "would defend his *person* and his *lawful* rights with the last drop of their blood." Obviously it was an *équivoque*. James understood his "lawful rights" in one sense, they in another. It must be remembered, in considering the use made of the phrase, that Churchill had openly warned James that he did not consider the introduction of Popery to be included among his "lawful rights," and that James had taken, on his accession, advantage of a similar equivocation. He had pledged himself to defend the "*just* liberties" of his country. Lord Wolseley shows clearly enough that the story of Churchill's design to carry off James, or even, as one report has it, to assassinate him, rests on no evidence, and is inconsistent with any intelligible reading of his course of action. Macaulay himself treats it as only developed out of James's own terrors.[4]

The letter which Churchill left with James when he fled to William's camp should be studied *in extenso*. Macaulay in giving his summary of it omits the most important paragraph, introduces it with one of his Jeffrey-like phrases, and does not allow the connection between each paragraph and Churchill's action to be understood. The letter runs thus:

"SIR,—Since men are seldom suspected of sincerity, when they act contrary to their interests, and though my dutiful behavior to your Majesty in the worst of times (for which I acknowledge my poor services much overpaid) may not be sufficient to incline you to a charitable interpretation of my actions, yet I hope the great advantage I enjoy under your Majesty, which I can never expect in any other change of government, may reasonably convince your Majesty and the world that I am actuated by a higher principle, when I offer that violence to my inclination and interest as to desert your Majesty at a time when your affairs seem to challenge the strictest obedience from all your subjects, much more from one who lies under the greatest obligations to your Majesty. This, sir, could proceed from nothing but the inviolable dictates of my conscience, and a necessary concern for my religion (which no good man can oppose), and with which I am instructed nothing can come in competition.

"Heaven knows with what partiality my dutiful opinion of your Majesty has hitherto represented those unhappy designs which inconsiderate and self-interested men have framed against your Majesty's true interest and the Protestant religion; *but as I can no longer join with such to give a pretense by conquest to bring them to effect*, so I will always with the hazard of my life and fortune (so much your Majesty's due) endeavor to preserve your royal person and lawful rights, with all the tender concerns and dutiful respect that becomes, sir, your Majesty's most dutiful and most obliged subject and servant,

"CHURCHILL."

The more we read this letter, the more it impresses us as being an honest statement of the feelings which were at this time determining Churchill's conduct. At the same time it is possible to doubt whether it was actually composed in its present form by Churchill alone. None of his habitual errors in spelling appear in it. Many of the

[4] Macaulay, iii. 256.

phrases are much better turned than was usual with him. It was probably a joint composition, carefully prepared, and we suspect that Turner had a hand in its composition.

The peculiar phrase "with which I am instructed nothing can come in competition" obviously refers to his consultation with Turner. The sentence put by us in italics suggests the real question for him. That the onus actually lay on him may be judged by the views both of James and William, quoted by Macaulay himself, out of connection with one another, and for the purpose of condemning him. "He, and he alone, has done all this," exclaimed James to his council on his return to London.[5] Of William the fearless, Macaulay admits that, "if there was anything on earth that he feared, it was Marlborough."[6] That "precedence in infamy" which was accorded to him by the Jacobites tells the same story. Not one word more is said in this letter about his regard for James's "royal person and lawful rights" than he had written to William and publicly said in William's camp. Taking the letter as a *bona fide* statement of his feelings, the whole subsequent action is intelligible. He joined in the "Act of Association" by which seventy peers and others bound themselves mutually to support one another and to *bring about the objects declared in William's proclamation*. He absented himself from all the discussions as to the regency or kingship. He, according to Lord Wolseley's very probable argument, purposely avoided employment in Ireland as long as James was personally in the field there. He accepted William's assumption of the throne as the only course open under all the circumstances. His wife, through Archbishop Tillotson and Lady Russell, persuaded Anne to forego her claims to the succession in William's favor in the event of his surviving Mary.

In Lord Wolseley's view, the Revolution upset all his ideas of loyalty. His only conception of loyalty, and that of those among whom he had been brought up, was for the king by divine right. His subsequent plottings were due to a desire to hedge, to secure safety for himself and his family in any event, at a time when it was scarcely possible to say who might ultimately be on the throne, and due further to dissatisfaction at the way in which he was treated by William. We read the evidence somewhat differently. But before entering into a statement of our general view on the subject, it is necessary, in order that it should be possible to discuss with any calmness Marlborough's action at all, to deal with the gravest of all the charges against him.

He is accused by Macaulay of having caused a disaster to the English arms and loss of life among English soldiers and sailors by enabling the French to make preparations against the attack on Brest in May, 1694; and of having done this in order to clear out of the way of his ambition the only Englishman, Talmash, who could at all

[5] Macaulay, iii. 265. [6] Ibid., vi. 170.

compete with him in reputation. It would scarcely be possible to dispose of the latter part of this charge more effectually than Mr. Leslie Stephen has already done. "Such insight," he writes, "into secret motives is only granted to men of Macaulay's omniscience." Mr. Stephen has also shown that Marlborough's letter to James was *not* the first intimation that he received of the attack on Brest, but that Godolphin, then First Lord of the Treasury, and Lord Arran had preceded Marlborough in sending the news. Lord Wolseley has gone much further. He has shown that a month before Marlborough's letter had reached the French court, Lewis, fully informed of the intended design, had sent Vauban orders to prepare Brest for the attack, giving him exact particulars of the English force. The whole correspondence is in the military archives in Paris. Lord Wolseley has also urged that Marlborough's only means of obtaining information was from Godolphin, whom he knew to be in secret correspondence with Versailles. As Marlborough held no office at the time, while Godolphin's information was authoritative, Mr. Stephen's contention that "the information from an authentic source might clearly be of the highest importance, even if more or less anticipated," falls to the ground. Marlborough's information was of the second-hand order, and not as authentic as that which had been already communicated and acted on, and it is practically certain that Marlborough knew this when he wrote. If that is so, then the only possible explanation of Marlborough's action is that he wished to leave an impression on James of his readiness to serve him at any sacrifice of honor or loyalty to England. This incident, therefore, takes its place as part of the general question of his correspondence with James, with which we next propose to deal.

Among the motives which influenced him in communicating with his old master was doubtless the wish to hedge, to be secure in any event. But it appears to us that the whole situation, as it presented itself to men of Marlborough's bringing up at the time, has to be taken into account; and, further, that, in attempting to realize the consistency which underlay the complex actions of a very mixed character, the king-maker element has here also to be allowed its influence. It is at least remarkable that Marlborough does not seem to have begun his correspondence with St. Germans till about the time when his old friend Turner, the deprived bishop of Ely, had also done so. Now, if we read the story aright, Turner's influence over him, direct and indirect, was very important. He was probably the most high-minded man with whom the cavalier courtier had ever come into close contact. Churchill at the time of the Revolution appears to have trusted him implicitly as a guide of conscience. It is certain that, clear as was Turner's advice to Churchill to assist William in protecting the liberties of England and resisting the imposition of Popery, he had no idea

of William's assuming the crown. He had held that Churchill's oath to James was limited by James's oath to protect the Church of England and the established liberties of the realm. May not he have urged, or may not Churchill himself have reasoned by analogy, that his oath to William as king, yielded, as it practically was, to *force majeure*, was similarly limited by the oath taken by William, and that that implied at least that he would rule as an English king and not as a Dutch conqueror? It is difficult to think that, when Burnet preached that William reigned by right of conquest, he did more than blurt out an unpleasant truth. William was certainly not the free choice of Parliament. Mary was. William chose to be king, and the force of circumstances decided in his favor. Parliament had virtually no choice but to accept him. When, then, keeping his Dutchmen on guard in London, he distributed all military commands over Englishmen to his Dutch officers, and lavished English estates on his Dutch followers, it must have seemed to Marlborough as if the precise dangers which the Non-jurors, and especially Turner, had foreseen, had been realized. Glad enough himself to escape service in Ireland whilst James was in the field there, Marlborough may well have been content to serve his first campaign during William's reign under Waldeck. But when Schomberg had done nothing in Ireland, whilst Waldeck's only success in Flanders had been due to Marlborough, it was not he only, or he apparently in the first instance, who began to resent the fact that everywhere only Dutchmen were favored, whilst the best work was done by Englishmen. William's judgment as a soldier was too sound, his appreciation of Marlborough's ability too great, and his sense of the importance to him of the capture of Cork and Kinsale too keen for him not to accept eagerly Marlborough's proposal to reduce them. When, however, Marlborough's brilliant campaign was brought to a successful issue, the fact that for services in Ireland large grants were again made to Dutchmen, whilst Marlborough's services were ignored, and a specifically promised Garter was withheld from him, was a national as much as a personal offense.

Marlborough's position under William now became very much what Churchill's had been under James. His action appears to have been the same in both cases. He warned William of the risk he was running, just as he had warned James. He told William that he was fully content with his own position, but that the English people exceedingly disliked foreigners being put over their heads, and the distribution of forfeited estates and crown heirlooms among foreigners. William, like James, bitterly resented his advice. Like James, though not to the same extent, he had to submit to grave humiliation for rejecting it. These are not the ways of one suffering from a "deep and incurable moral disease which had infected the whole man."[1] Had his original

[1] Macaulay, vi. 64.

purpose and design been to play the traitor, it is obvious that he would have worn the smoothest and most flattering exterior to William. No one could have done it with more grace and skill. He did nothing of the kind. Apart from this wise and bold counsel, he had deeply offended both William and Mary by supporting the Parliamentary grant to Anne, which they had resisted. Since at this time Mary's life appeared to be a much better one than her sister's, it is difficult to see how personal motives can have entered into the deliberate choice of both Marlboroughs to remain loyal to Anne rather than to curry favor with the king and queen.

About three months after the completion of his campaign in Ireland, of which Lord Wolseley has given a full account drawn from various sources, but especially valuable because of his personal study of the ground and of local information, Marlborough began his correspondence with James. What were his objects? His success had created the greatest enthusiasm throughout England, because it was the success of an English and not of a Dutch general. He became almost inevitably the centre of the popular discontent against the Dutch domination. It was scarcely likely that the English officers who had smarted under the authority everywhere given to Dutchmen, or the English noblemen who had stood like lacqueys behind William's chair whilst he caroused with his Dutch favorites, or the ladies who, like Anne, had been subjected to his boorishness, would restrain their tongues when in the presence of a singularly genial and frank-spoken leader, who had notoriously suffered as they had done. Marlborough had the best means of gauging the strength of the rising feeling, and had to choose whether to restrain it or to lead it. The Non-juring bishops, six months earlier, while his attention was absorbed by the preparations for his Irish campaign, had been subjected to a scandalous attack, in which it had been suggested that they should be murdered by the mob as the De Witts had been. They had not been allowed by the government to publish their defense, but had printed it without license. The feelings of all those with whom Marlborough associated had been enlisted in their favor. It was soon after this that Turner had begun to correspond with James, and had come to regret, not apparently the part that he had played with the others in refusing to publish James's illegal declaration of tolerance, but their insistence on their rights as English peers, which had been the actual cause of their incarceration in the Tower, and so had led more directly than any other incident to the Revolution.[8] Marlborough at all events did not restrain the rising feeling of opposition to the foreign ascendency, but ostentatiously and publicly led it and fomented it. Under such circumstances, it was natural for him to wish to unite together all those who

[8] See the careful working out of this question and of Turner's conduct in Dean Plumptre's "Life of Ken."

could help in freeing England from the foreign rule. There is nothing to show that he desired to do more than to reduce William to that position of administrator to which it had been the object of Churchill's party originally to limit him. He wanted the assistance of the Jacobites and of James in gaining this end. If Turner had the influence over Churchill which we incline to attribute to him, the ex-bishop may well have persuaded his friend that, in agreeing to the actual deposition of James, he had exceeded the advice formerly given him, and that he ought to express regret for having so far injured his benefactor and deposed the "Lord's anointed." William had not hesitated to obtain information from ministers whilst they held office under James. Why should William's ministers serve him, the *de facto* king, with a loyalty which William had not expected from the servants of the king *de jure*, with a faithfulness which he had not exhibited to his father-in-law or to his wife? We are stating the arguments as they would present themselves to Turner or to Churchill. We, of coure, do not defend the consequent action. What seems to us to be required is that dramatic treatment which in the hands of a master makes us almost sympathize with John as well as with Arthur, which at least makes human and real the workings of the mind of Macbeth or Lady Macbeth. We want to understand the man. Mere invective does not help us to that end.

As Marlborough's whole scheme, whatever it was, was never disclosed, much of it is a mere matter of conjecture. It is practically certain that, whether as a final or a preliminary step, he intended to anticipate by a year or two that Parliamentary vote which ultimately obliged William to send his Dutchmen home, and forced his Dutch favorites to disgorge a portion of their spoils. We fully agree with Lord Wolseley that it is clear that he never intended to assist James in remounting the throne without valid guarantees, such as it was practically impossible to secure from a man on whose word, as he well knew, no reliance could be placed. But we hardly think that Lord Wolseley does justice to the nicety of the distinction, into which an attempt to reconcile their theories with the hard necessities of the case had forced many more besides Marlborough. Though they had no wish whatever to put power into James's hand to introduce Popery, and, with Popery, dragonnades, they did wish to have things done in his name as king; they did not wish the succession to be broken.

It seems to us that Marlborough was affected by all those feelings of the cavalier which had grown with his growth and strengthened with his strength, up to 1685 at least. The bloody assize and the dragonnades had inflicted on them a deadly wound. That they should wake to life in 1691 was very natural. That they should affect his language when writing to James would almost inevitably follow. That, mingled with all this, there should be the swellings of personal

pride and personal ambition, the sense of power and the desire to clutch from incompetent hands by any means the tools they could not use, which he knew that he could use so brilliantly, is only in accordance with human nature. That among the forces which he intended to employ for his ends were his own and his wife's influence over Anne, that he was in fact making a "party of the heir apparent," is obvious enough. But it seems to us that James was right in thinking that it was a mere blunder of his partisans to assume that Marlborough was contemplating an attempt by violence to seat Anne on the throne during Mary's or William's lifetime. He was not, like James, the man to seek the path of most resistance. He did want to force William into employing English troops with English officers and himself at the head of them. He concentrated for that purpose all the forces he could bring to bear on it. William thoroughly understood and feared him. The reasons that William assigned to Burnet for Marlborough's dismissal almost exactly correspond with the explanation which we have offered of his conduct.

A puzzling feature in the transactions is that it does not seem to have occurred to such clever people as Marlborough and his wife that their bosom friend Lady Fitz-William was as certain to be in daily correspondence with her sister, William's mistress, as Lady Marlborough was with her own sister, Lady Tyrconnel. Perhaps the explanation is that Marlborough was not particularly unwilling to let William know that he had a second string to his bow. If he had wished to carry on a secret intrigue, he would hardly have talked as openly as he did. He trusted for his safety to the fact that he expressed the feeling of the English nation and army. It was the attitude of the tribune, of the king-maker, and, in the strength of that position, he boldly fronted his enemies, even when he was sent to the Tower. No public charges could have been brought against him that would not have fomented a counter-revolution. As to the charges of peculation and the like, Mr. Stephen and Lord Wolseley have independently shown that there is one simple answer. Had they been true, his enemies had every facility for proving them and every motive for doing so. They failed to do so in any single instance.

We may now sum up our view of the man, as we understand his history. Brought up with the feelings of a cavalier, and passing his younger days in a most licentious court, he yielded as a young man to one of the many temptations around him and kept himself aloof from others. By penurious care he escaped debt, and the habit of not spending enabled him to accumulate a vast fortune, which, together with the enormous power that he wielded under Anne, excited the jealousy of his contemporaries, and led to those charges of preferring money to honor which have formed the staple accusations against him. Yet he frequently refused to accept money that was offered him; notably,

in one instance, an income of sixty thousand pounds a year, which the emperor had intended to bestow on him. Among a generation of courtly adulterers he was faithful to his wife. To James and William and Anne he was loyal during dark days, and began to plot when the sun was shining on them. Forced at the Revolution to choose between unlimited power if he would join in forcing the yoke of Popery on England, and the abandonment of a master under whom he had risen, he chose to abandon his master. He had never wished to see William king; but, accepting the inevitable, he took the oaths to him as he had done to James. When he found that to speak English was a bar to promotion under William, he plotted very openly to shake off the Dutch rule as he had plotted to shake off the Irish. In both cases he did things which cannot be defended; in both his motives were mixed; in both he acted as the representative of English feeling. If without him such a man as Monmouth might have been king, if without him the Revolution would not have been attempted, but instead a religious and military tyranny would have been established, then, whatever the stains on his career, the debt that we owe to him is enormous. Kingmakers are rarely saints, and Marlborough was none. But the malignity with which his actions were traduced is rather a tribute to his influence than a proof of his wickedness.

Lord Wolseley's biography has already made its mark and established its place in literature. It is written with the fire of a soldier who, while he has no wish to slur over the errors of one whom he regards as the very greatest of English soldiers, yet feels intensely that the grossest injustice has been done to him; that the services which apart from his victorious campaigns he did for England have been ignored, and that the miserable lies invented by jealous enemies have been accepted as truth and recorded as history.

ORIGIN AND DEVELOPMENTS OF STEAM NAVIGATION.

(Continued from page 477.)

1861.—STEAMERS IN JAPAN.—In 1861 the Prince of Satsuma purchased the "England" and the "Scotland," two British screw steamships of eleven hundred tons gross register, being the first foreign vessels purchased by the Japanese, except by the government. As evidence of the skill and ingenuity of the Japanese, they made boilers of copper for the "England" within twelve months of the time when she came into their possession. The "England" was seized and scuttled in August, 1863, by the English at the bombardment of Kagosima, and sunk in deep water. The "Scotland" was still in the service of the Japanese in 1870.

1861.—THE "MONITOR."—A resolution of the United States Senate, July 24, 1868, requested the Secretary of the Navy to communicate to that body the facts concerning the construction of the ironclad "Monitor." In answer, Secretary Welles made an elaborate report[1] detailing the history of her construction, together with that of two other ironclads,—the "New Ironsides" and the "Galena," constructed differently, as recommended by a board of navy officers September 16, 1861, composed of Commodores Joseph Smith and Hiram Paulding and Commander Charles Henry Davis.

The Secretary visited Connecticut in September, and while at Hartford, C. S. Bushnell, Esq., brought him the plan of the original "Monitor," invented by Captain John Ericsson, of New York. It received the instant approval of the Secretary, who requested Mr. Bushnell to proceed to Washington without delay and submit it to the board. He was assured that in case of unavoidable delay beyond the time limited for receiving proposals, an exception should be made in favor of this novel invention of a submerged vessel with a revolving turret, and that it should be embraced among the plans on which the opinion of the board would be required.

The board of officers in their report say, with regard to Mr. Ericsson's proposition,—

"This plan of a floating battery is novel, but seems based on a

[1] Executive Document, No. 86, Fortieth Congress, second session.

plan which will render the battery shot- and shell-proof. We are apprehensive that her properties for sea are not such as a sea-going vessel should possess. But she may be moved from one place to another on the coast in smooth water. We recommend an experiment be made with one battery of this description on the terms proposed, with a guarantee and forfeiture in case of failure in any of the properties and points of the vessel as proposed. Price, $275,000; length of vessel, 172 feet; breadth of beam, 41 feet; depth of hold, 11½ feet; time, 100 days; draught of water, 10 feet; displacement, 1255 tons; speed per hour, 9 statute miles."

In accord with this recommendation, on the 4th of October, 1861, John Ericsson, John F. Winslow, John A. Griswold, and C. S. Bushnell contracted with Gideon Welles, the Secretary of the Navy, on behalf of the United States, to build the original "Monitor," as she was later named by her inventor, and to have her and her equipments in all respects ready for sea in one hundred days after the date of the contract. The agreement was "to construct an ironclad, shot-proof steam battery of iron and wood combined on Ericsson's plan; the lower vessel to be wholly of iron, and the upper vessel of wood; the length, one hundred and seventy-nine feet; breadth, forty-one feet; depth, five feet, or larger if the contractors thought it requisite to carry the armament and stores required." Masts, spars, sails, and rigging were to be furnished sufficient to drive the vessel six knots an hour with fair breeze of wind; steam-power was to be supplied to give her a speed of eight knots, and she was to carry provisions, water, and stores of all kinds for one hundred persons for ninety days, and fuel for her engines for eight days; the deck, when loaded, was to be eighteen inches above the load-line amidships. It was also expressly stipulated that no member of Congress or officer of the navy, or any person holding office under government, should share in the contract or in any benefits arising from it,—a wise provision.

The payments made to the contractors, as per agreement, the last being only five days before the "Monitor" sailed from New York, were as follows:

1861, November 15, first payment, $50,000, less 25 per cent.	$37,500
" December 3, second payment, $50,000, less 25 per cent.	37,500
" December 17, third payment, $50,000, less 25 per cent.	37,500
1862, January 3, fourth payment, $50,000, less 25 per cent.	37,500
" February 6, fifth payment, $50,000, less 25 per cent.	37,500
" March 3, sixth payment, $25,000, less 25 per cent.	18,750
" March 14, last payment, reservations	68,750
Total	$275,000

By the terms of the contract the reservations were to be retained until the points and properties of the vessel were fully tested, not ex-

ceeding ninety days. Her performance from New York to Hampton Roads and her encounter with the "Merrimac" were deemed satisfactory tests, and the payment of the reservations was made within one week after that action, as will be seen by the date of the last payment. Erroneous newspaper statements were made that the "Monitor" "was built by the contractors at their own risk, and that the government was not to be called upon for remuneration until the vessel had been tested in action. Strong in faith, receiving but a negative support from the Navy Department, the contractors completed the 'Monitor' at their own cost." It was also stated that a member of the House of Representatives from New York "advanced the money and paid the expense of getting the 'Monitor,' which met the 'Merrimac' at Hampton Roads, built." The truth is the money applied to build the "Monitor" was appropriated by Congress in August, and the money promptly handed over to the contractors, agreeably to their contract, as the work progressed. While building, the novel experiment received ridicule and abuse, but after her wonderful achievement in Hampton Roads the tone was changed, and persistent efforts were made to deny the Navy Department any credit for her adoption and construction.

The "Monitor" left New York March 6, 1862, under command of Lieutenant John L. Worden, and on the 8th reached Hampton Roads, and the next day her memorable encounter with the "Merrimac" took place.

The hull of the "Monitor" was built by Mr. T. F. Rowland, at Greenpoint, from Captain Ericsson's drawings,[2] and under his personal supervision, the material being furnished by his associates, Messrs. Griswold, Winslow, and Bushnell. The turret was built at the Novelty Iron Works, agreeably to his plans and under his supervision, with plates, rivets, etc., furnished by his associates. Being too heavy for transportation, it was taken down and placed in sections on the deck of the vessel. The port-stoppers, of heavy hammered wrought iron, were made at the steam-forge of Mr. C. D. DeLancey, in Buffalo. After the guns were discharged and run back into the turret, the stoppers were swung over the port-holes, to prevent any shot from entering the ports. The closing, being regulated by machinery, was instantaneous, and that side of the turret swung away from the enemy, the guns loaded and swung back again, and guns discharged. Thus the ports were constantly protected, either by the guns obstructing or by the ports being closed by the stoppers.

The entire internal mechanism of the turret was built to Captain Ericsson's working plans at the Delamater Iron Works. The hull and side armor was put up by Mr. Rowland. The mode of launching was planned by him. To prevent the vessel, when fully equipped

[2] "A Brief Sketch of the First 'Monitor' and its Inventor," a paper read before the Buffalo Historical Society, January 8, 1874, by Eben P. Dorr. 8vo. Pp. 49.

with machinery, turret, and armor, from plunging under water, Mr. Rowland constructed large wooden tanks, securing them under the stern. The result of these joint efforts was that within one hundred days from laying the keel-plates of the hull the whole work was completed and the engines of the vessel put in motion under steam.

The "Monitor" was launched on the 30th day of January, 1862, and her first trial trip and delivery to the navy-yard was February 19, 1862. She had two trial trips afterwards. On her second trial she could not be steered, and went no farther than the foot of Wall Street, New York. On the third trial trip, about March 4, she went down to Sandy Hook and tried her guns, having on board a board of officers consisting of Commodore Gregory, Chief-Engineer Garvin, and Constructor Hart, who reported favorably of her performance.[3]

How the name "Monitor" was given to this first turreted ironclad —a name that has since become generic for all this class of vessels—is told in the following letter from its inventor ten days before her launch:

"NEW YORK, January 20, 1862.

"SIR,—In accordance with your request I now submit for your approbation a name for the floating battery at Greenpoint.

"The impregnable and aggressive character of this structure will admonish the leaders of the Southern Rebellion that the batteries on the banks of their rivers will no longer present barriers to the entrance of the Union forces.

"The ironclad intruder will thus prove a severe monitor to those leaders. But there are other leaders who will be startled and admonished by the booming of the guns from the impregnable iron turret. 'Downing Street' will hardly view with indifference this last 'Yankee notion,' this monitor. To the Lords of the Admiralty the new craft will be a *monitor*, suggesting doubts as to the propriety of completing those four steel-clad ships at three and a half millions apiece.

"On these and many similar grounds I propose to name the new battery 'MONITOR.'

"Your obedient servant,
"J. ERICSSON.

"To GUSTAVUS V. FOX,
"Assistant Secretary of the Navy."

[3] Previous to 1854, Ericsson's mind had dwelt upon the idea of planning and constructing an iron-plated shot-proof ship of war, and on the 26th of September, 1854, he forwarded from New York to Napoleon III. a plan of such a ship, with a synopsis of his plans, which shows beyond all cavil that America is the birthplace of the "Monitor," and that John Ericsson, the Swede, is its sole inventor. Ericsson's letter was promptly acknowledged by the Emperor, but he did not embrace the opportunity offered, and the first monitor was built for the United States in the early period of its civil troubles.

When the "Monitor" was nearly ready for commission, Lieutenant Worden was authorized to select a crew for her from the receiving-ship "North Carolina," or any other vessel of war in New York harbor. Under that authority he asked for volunteers from the "North Carolina" and the frigate "Sabine," and after fully stating to the crews of those vessels the probable dangers of the passage to Hampton Roads, and the certainty of important services to be performed there, he had many more volunteers than was required. It is unnecessary, and would be out of place here, to detail the fight in Hampton Roads,—the first naval duel between ironclads; that belongs more properly to the naval history of the period. Suffice it to say, the little turreted vessel, mounting but two guns, stood up successfully to the defense of twenty-one ships of war, mounting two hundred and ninety-six guns, all alike defenseless against the attack of the ironclad "Merrimac." She was a modern David, taking the forefront of the battle against a modern giant Goliath, while the hosts stood by anxious spectators of the conflict.

From the 10th of March until the destruction of the "Merrimac," on the 11th of May, the "Monitor" remained at Hampton Roads, guarding the Elizabeth and James Rivers, always ready for the "Merrimac." During this time her pilot-house was strengthened by heavy pieces of oak and three one-inch layers of iron plates. May 8 she engaged the battery on Sewell's Point in company with the fleet. May 12 she led the vessels that went to Norfolk when that city was evacuated by the rebels. On the 15th she participated in the engagements of Fort Darling, seven miles below Richmond. From that time until the retreat of the army from the Peninsula she was employed patrolling the James River, and arrived at Newport News August 31, being the last vessel that came down the James River. In September the "Monitor" proceeded to the Washington Navy-Yard for repairs, and sailed again for Hampton Roads in November.

On the 29th of December, 1862, under the command of Commander John P. Bankhead, she sailed for Beaufort, North Carolina, in company with the United States steamer "Rhode Island," her convoy, and on the night of the 30th she foundered near Cape Hatteras. About half of her officers and crew were carried down with her, the others escaped to the "Rhode Island." The cause of her foundering is not known. "It may, perhaps," says Mr. Dorr, "be assigned to the fact that she had lain all summer in the hot sun of the James River. The oak timber which had been fitted to the top edge of the iron hull had shrunk so that when in the heavy sea there was two or three feet of water over it most of the time on the weather side, and the water found its way through this space and flowed in great volume into the ship with fatal effect." There can be, I think, no doubt that the battering the great overhang of her deck received from the heavy seas

caused it to separate from the hull to which it was fastened, and allowed the water to flow in which sunk her. The report of the board of officers who recommended her construction says they were "somewhat apprehensive that her properties for sea are not such as a sea-going vessel should possess," and this opinion was fully borne out by this result.

1863.—THE "FAID RABANI."—A beautiful steamer, the "Faid Rabani," or "Divine Favor," was built as a river pleasure yacht for the Pacha of Egypt by an English firm in 1863. She was an exquisitely-modeled vessel of the following dimensions,—viz., keel and forerake, one hundred and eighty feet; breadth of beam, twenty feet; depth of hold, nine feet; draught of water, three feet; power of engines, one hundred and fifty horses. The yacht was furnished with oscillating engines, had feathering paddles, and performed thirteen knots an hour without the slightest perceptible vibration. Her engines were bright with brass and steelwork, and finished with the same taste and care used in turning out a gold watch. Although the vessel had an ordinary escape-pipe, it was not used, for the steam was blown into the water from the sides of the yacht. She had three safety-valves and a beautiful small brass donkey-engine, independent of the others, for supplying the boilers with water when the large engines were still. The principal features of the "Faid Rabani," however, were her splendid interior furnishings and decorations, including no less than four hundred and fifty pictures of separate subjects, set in frames. His Highness's reception-room, which was in the poop, was an apartment of unrivaled beauty, fitted up with the richest rosewood bulkheads, door, etc., the panels of which were filled with beautiful pictorial designs on *papier-mâché*. The divans extending round the saloon were covered with costly cloth of gold, from the front of which was suspended gold-embroidered needle-work and massive gold-bullion fringe. Between the windows were pictures of fruit and flowers, birds, etc., and vases enriched by precious stones, executed by a new patent gem-enameling process. The ceiling between the beams—which were of mahogany, French polished—was filled with designs of fruit and flowers on *papier-mâché* panels, enriched with gold-border mouldings. His Highness's bedroom was fitted up in a corresponding style of elegance. The cabins were decked out in a style of great costliness and magnificence; the fore-cabin contained twelve apartments for the pacha's officers and suite. A beautiful awning covered the main deck and poop. In point of decoration the outside of the yacht was worthy of the interior. Round all the windows, from stem to stern, were carved and gilt architraves, and the bulwarks were ornamented with carved fretwork, relieved with gold. The paddle-boxes were also highly ornamented, and on a shield in the centre was the vessel's name in Arabic. The figure-head was composed of his

Highness's crest, supported by two lions richly gilded. The hull was painted a very rich green color, and was literally one blaze of gold from stem to stern.

1864.—WINAN'S CIGAR-SHAPED STEAMSHIP.—In 1858, Messrs. Winans, of Baltimore (see *Harper's Weekly*, October 28, 1858, where drawings were given), built a cigar-shaped steamer which was expected to revolutionize transatlantic steam navigation. In 1864 they built at Millwall, London, a somewhat similar vessel. She was a great iron tube, tapering away to a point at each end, and presenting the strangest possible form for a ship, her deck being merely the arc of a circle, on which were riveted stanchions for rails, and between these a raised platform with seats on each side. She had neither keel nor cut-water, and, in the language of her inventor, there was "no blunt bow standing up above the water line to receive blows from heavy seas, no flat deck to hold, or close bulwark to retain, the water that a rough sea may cast upon the vessel, neither masts, spars, nor rigging."[4] The length of the vessel was one hundred and eighty feet, or sixteen times its breadth of beam, the whole length being made available to secure water-lines favorable to fast speed. She was fitted with high-pressure engines, and her boilers were on the principle of those used on railway locomotives. The propelling power was a novel application of the screw. She appears to have failed for want of sufficient stability.

Messrs. Perkins & Sons, of London, subsequently patented a similar design, and proposed to construct and run an experimental fast express steamer from England to New York. It was proposed she should be *eight hundred* feet in length, with forty feet beam, and have a flat bottom. She was not to draw more than eleven feet of water with her cargo, passengers, and five hundred tons of coal on board.[5]

1865.—THE "DUNDERBERG" OR "ROCHAMBEAU."—The steam ram "Dunderberg" was launched from the yard of W. H. Webb, New York, July 22, 1865. Her length was 378 feet, breadth 73 feet, depth of hold 23 feet, tonnage, 7060 tons. Her sides, five feet thick, were covered with a five-inch plating of iron. Her guns threw shells of 500 pounds, and she was driven fifteen nautical miles by an entirely concealed force of 1200 horse-power. After offering her to the United States government, which had about wound up its expensive civil war when she was launched, Mr. Webb sold her to the French government, who renamed her the "Rochambeau," but in their hands she did not prove a success. Having been built of unseasoned white oak, she soon required extensive repairs, and was finally broken up without having performed any war service.

[4] We see here a rude type of the domed steamships of 1882, expected to make great speed in crossing the Atlantic.

[5] See W. S. Lindsay's "Merchant Shipping," vol. iv., pp. 568–573.

The "Dunderberg" was built under the general superintendence of Rear-Admiral F. H. Gregory, U.S.N. The following description of this novel vessel and her launch is derived from the New York *Sun:*

"At three minutes past nine o'clock on Saturday morning, at Webb's yard, New York, was launched the great naval curiosity of the age, the monster iron ram 'Dunderberg,' the mightiest vessel in the world. Admiral Francis H. Gregory, with Commander Ringgold, and other members of his staff, occupied a stand decorated with bunting, on shore and near the bow of the vessel. A large number of other distinguished personages were present.

"The 'Dunderberg,' on reaching the dock, was found to be drawing only fifteen feet aft, thirteen feet amidships, and nine feet six inches forward. The lightness of this draught is truly wonderful, and it is far less than many people supposed it would be. The ship, dressed off in flags and streamers, and her decks covered with ladies and gentlemen, made a splendid appearance in the water.

"Early in the beginning of the late Civil War, the builder of the 'Dunderberg,' Mr. W. H. Webb, prepared the general plan for the construction of a vessel to combine the requirements of the most powerful war-vessel afloat, before the monitors began to dot our coast line. The demand for vessels for blockading and swift cruising monopolized the attention of those who had the subject in charge. At last the order was given and the keel of the 'Dunderberg' was laid.

"Due care has been taken to render the 'Dunderberg' safe in a heavy seaway, being intended for a sea-going vessel. The prime necessity of offering the utmost resistance to the missiles of an enemy, was by no means lost sight of, and the advantages of an angular surface to receive the enemy's fire has been combined with a great mass of timber and the protective powers of four and a half inches of solid armor plating. In general appearance she will resemble, when afloat, a huge fort embrasured for a score of the heaviest ordnance yet placed upon the deck of any vessel. Her magnitude and novel design will be rendered pleasing to the eye by her spars and outward fittings; but the lack of the common symmetry displayed in marine architecture will lose its quaintness and be changed into a feeling of admiration of her grandeur and power.

"The whole object in the construction of this noble vessel has been to make the most terrible war-vessel in existence; one that could protect our large harbors, but, if required, launch out in mid-ocean to meet the enemy, or cross over and place under contribution any of the ports of Europe, or crush out any naval force that attempted to impede her progress.

"The hull of the 'Dunderberg' is built of several thousand feet of solid timber of the finest quality and choicest selection. The bottom

is flat, the sides angular and sharp, surmounted by a casemate of sixteen guns, although pierced for twenty-one. The hull is built of square logs, bolted together, leaving no openings, and caulked inside as well as outside. This massive structure is strongly trussed with diagonal braces of iron fastened inside of the solid frame, in such a manner it seems impossible she could be damaged by any ordinary disaster. The hull is three hundred and eighty feet four inches in extreme length, and seventy-two feet ten inches extreme beam. The main hold is twenty-two feet seven and a half inches in depth. Her tonnage is set down by the naval authorities in the register as five thousand and ninety tons.

"The 'Dunderberg's' bulkheads are such she may properly be described as a double vessel, one being built inside the other. The outer vessel destroyed or seriously injured, the inner one would be able to buoy up the mass. The bulkheads run longitudinally as well as transversely, inclosing the engines, and furnishing ample space for the coal-bunkers, which, when filled with coal, give security to the engines and boilers against shot or a ram driven by the enemy.

"The *ram* is *the* feature of the 'Dunderberg,' and will attract observation and comment. It is a portion of the ship itself. It is the bow of the vessel fashioned into a huge beak, and is a solid mass of timber extending back fifty feet, arranged with a wrought-iron front-piece to protect it from shot and abrasion in contact.

"The planking of the outer hull is five inches in thickness. Outside the outer planking is the covering of logs. This commences at nothing and widens out at the top to seven feet, so that at the bilge it is three feet, and at the water-line six feet in thickness. On the cushion, which is filled in solid, is placed the armor.

"The captain's cabin is on the main deck and in the casemate aft. The ward-room is on the berth-deck aft, and forward of it will be the steerage, for the junior engineers, midshipmen, and mates.

"She will be provided with four heavy anchors, two 'bowers' and two sheet anchors, with several hundred fathoms of chain of the finest quality of iron. She will have a number of stream anchors and kedges. Two capstans will be placed on deck, one forward and one aft, while forward is a windlass of great power.

"Very large and improved magazines and shell-rooms are placed, one forward and the other aft.

"The engine department is provided with several large and powerful pumps, for clearing the ship of water in event of a leak, as well as protection against fire. In addition are two sets of hand-pumps, which can be used for like purposes, and besides are two eight-inch steam pumps which are worked independent of the engine. The vessel is supplied with one of Normandy's fresh-water condensers capable of providing two thousand gallons of drinking-water per day.

"*The Armor.*—The armor required for the 'Dunderberg' will be about one thousand tons. The side-armor, of the best hammered iron, is manufactured into slabs, from twelve to fifteen feet in length, by three feet in width. These plates are three and a half inches, and are screw-bolted to the armor cushion by one-and-a-half-inch bolts. The plates are placed vertically, and not horizontally, as in the case with the iron-clad vessels of Europe. The armor of the casemate is four and a half inches thick, placed vertically on the sloping sides, and screw-bolted with one-and-a-half-inch bolts, which enter the wood-work to the depth of eighteen inches, none of the fastenings passing through the sides; so there will be no nuts or bolts flying about the deck in action. These slabs are twenty-eight inches in width, and are eight feet in height. The top of the casemate will have a light bomb-proof armor. The main deck outside of the casemate will be covered with thick armor, and will be secured to the deck by three-quarter-inch iron bolts with counter-sunk heads. The armor will extend out over the shelf which serves as a protection to the screw and the two rudders.

"The pilot-house is six feet in diameter, seven feet in height, and ten inches in thickness, and is on the forward upper deck of the casemate.

"In guarding against the assault of the enemy in the rear, Mr. Webb has arranged the stern with a view to obtain the greatest strength and protection, combined with lightness of construction, to avoid the drag of the water as well as the jar in a seaway, this necessary projection pounding upon the waves. This marvel of strength, with its braces and supports, is generally conceded deserving of the highest praise as a piece of skill and ingenuity.

"Beneath this shelf is the enormous propeller, weighing 32,000 pounds, the largest ever cast of composition. The screw shaft has no out-board bearing, but works upon a massive metal stern bearing, lined with strips of *lignum vitæ*. The screw is twenty-one feet in diameter, four feet in diameter at the hub, and tapering down to three-quarters of an inch at the edge of the four blades, and has a pitch of from twenty-seven to thirty-feet.

"The main rudder is abaft the propeller, and is a massive wooden structure. Forward of the screw, and over the propeller shaft, is a spare rudder, which can be put in service should any accident occur to the main rudder.

"The casemate of the 'Dunderberg' surmounts her hull, and is a tower of strength. It is constructed of square logs, each one foot in thickness, and is built to the height of seven feet in the clear, and covered over with a bomb-proof deck, on which it was intended to place two turrets, similar to those in use on board of the monitors. The casemate will contain twelve to fourteen 11-inch Dahlgren, and

four 15-inch Rodman smooth-bore guns, making it the heaviest armament of its number ever placed on the deck of any vessel. The 'Dunderberg' contract price was one million four hundred thousand dollars.

"The hull of the vessel from below the water-line rises to the gunwale at an angle of about thirty-five degrees, when it joins the casemate, which inclines inward at an angle of about fifty-five degrees. This, it is expected, will 'shed' shot with perfect ease and certainty.

"To support the immense weight, and give strength to the bottom of the fabric, the vessel has an enormous keel and four keelsons, on which rest the bed-plates of the engines, and furnish the foundation for the upright stanchions or supports which aid in holding up the weight of the casemate and its contents.

"The 'Dunderberg' will be rigged as an hermaphrodite brig,—*i.e.*, having yards upon her foremast and fore-and-aft sails upon her mainmast. She will spread several thousand yards of canvas, which will steady her in a seaway and aid her in making a passage across the ocean or cruising at sea or along our shores. She will be provided with boats to accommodate six hundred souls.

"GENERAL DIMENSIONS OF THE SHIP.

Extreme length	380 feet 4 inches.
Extreme beam	72 " 10 "
Depth of main hold	22 " 7 "
Height of casemate	7 " 9 "
Length of ram	50 "
Draught when ready for sea	21 "
Displacement	7000 tons.
Tonnage	5090 "
Weight of iron armor	1000 "

"DIMENSIONS OF ENGINES, BOILERS, ETC.

Cylinders (two) each	100 inches.
Stroke of pistons	45 "
Boilers—six main and two donkey.	
Depth of boilers	13 feet.
Height of boilers	17 " 6 inches.
Front of boilers	21 " 6 "
Weight of boilers	450 tons.
Boiler surface	30,000 feet.
Grate surface	1,200 "
Condenser surface	12,000 square feet.
Diameter of propeller	21 feet.
Pitch of propeller	27 to 30 feet.
Weight of propeller	34,580 pounds.
Capacity of coal-bunkers	1,000 tons.
Actual horse-power	5,000 horse.
Nominal horse-power	1,500 "

"*The Engines.*—The 'Dunderberg' will be propelled by two horizontal back-acting condensing engines of five thousand actual horse-

power, subjected to the most critical inspection at the instance of the Navy Department, and pronounced without fault or blemish in any respect. They are massive, beautiful, and powerful, and reflect credit upon their builders. The cylinders are two in number, and each one hundred inches in internal diameter, with forty-five inches stroke of piston. These enormous cylinders were bored out horizontally to prevent springing. The engines have one of Allen's patent surface condensers, of the tubular pattern, ten feet in width, twenty-six feet long, and five feet deep. The air-circulating and condensing pumps are worked independently. The air-pump has two steam cylinders, 36 x 36 inches, working the pump, which is also 36 x 36 inches. The circulating pumps, two in number, and the condenser pumps, 33 x 36 inches, with 36-inch cylinders and 45-inch stroke. There is one bilge-pump for each engine, and two donkey-pumps with 9-inch cylinders and 12-inch stroke. There are four blowers for ventilation, driven by independent engines.

"The main engines are reversed by two small engines which can be controlled by a small boy. The engines will make sixty revolutions per minute, ordinary speed, on a pressure of twenty-five pounds of steam. The pumping, air-condensing, and circulating engines will run at forty-five revolutions per minute. A prominent feature of the engine department of the 'Dunderberg' is the mechanical skill displayed in the placing of the line-shafting and bearing of the propeller-shaft. The main bearings are forty inches in length, and are provided with hollow brasses for water circulation. The thrust-bearing has thirteen thrust-collars on the shaft, and in addition a ball-thrust is attached. Steam is furnished to the engines by six horizontal tubular boilers, each thirteen feet in depth, seventeen feet six inches in height, and twenty-one feet five inches front. The furnaces are situated in two tiers, with ten furnaces to each boiler, making a total of sixty furnaces in the main boilers. There are two donkey-boilers, each with four furnaces. The smoke-pipe is thirteen feet in diameter, and where it passes through the gun-room it is shot-proof. It contains a grating to prevent anything being thrown down to damage the boilers. Some idea can be formed of the size of the smoke-stack when we state that it is sufficiently commodious, standing upright, to accommodate twenty persons seated around a table placed inside. Bulkheads of iron are placed transversely at each end of the space occupied by the boilers and machinery; these extend from the floors up to the spar-deck, and form water-tight compartments of sufficient capacity to float the ship in case of an emergency. The coal-bunkers have a capacity of one thousand tons. The propeller shaft is in four sections, and is one hundred and eighteen feet in length; it is eighteen inches in diameter, and is supported by four main journals. The stern bearing is of brass and extends outside of the vessel two feet. The engines are expected

to give the screw sixty revolutions per minute, working at an ordinary and regular rate of speed, although it is believed in case of need they can be worked up as high as seventy-five or eighty turns. The former rate can be attained with twenty-five pounds pressure of steam, but by the addition of the donkey-boilers and full firing, steam can be raised to forty pounds. The contract calls for a speed of fifteen knots per hour. The 'Dunderberg' will carry from ten to fifteen days' coal. The cost of the engines and boilers will be over half a million of dollars."

1866.—THE DOUBLE-TURRETED MONITORS "MONADNOCK" AND "MIANTONOMOH."—This class of vessels was never designed for cruising purposes, but for harbor defense and operations upon the coast of the United States, and, owing to the foundering of the original "Monitor" off Cape Hatteras, and another of these vessels in the blockade off Charleston, an impression prevailed that they could not be sent with safety outside the harbors in which they were constructed. To dispel this false impression the Secretary of the Navy decided to send the "Miantonomoh" across the Atlantic to Europe and return, and the "Monadnock" *via* the Straits of Magellan to California, but not without accompanying vessels to tow them if needed, and to insure the safety of their crews in case of disaster or shipwreck. The "Monadnock," after navigating the Atlantic and Pacific, reached San Francisco in safety and was placed in ordinary at Mare Island Navy-Yard, where an iron vessel of the same name and similar dimensions has since been built, to receive her engines and machinery, the old wooden hull having become decayed. The "Miantonomoh," a vessel of the same size and type, crossed the Atlantic, passed up the Baltic to Cronstadt, visited many of the principal ports of Europe, and returned in safety to the United States. Like her sister vessel, her wooden hull, having become decayed, has been replaced by an iron one, and her iron plating has been exchanged for one of compound steel.

The "Monadnock," under command of Lieutenant-Commander Francis M. Bunce, sailed from Hampton Roads, Virginia, November 2, 1865, in company with the "Vanderbilt" and the "Powhatan," paddle-wheel steamers, and the "Tuscarora," a screw ship, and arrived at St. Thomas, West Indies, November 11, after a somewhat stormy passage of nine days. "The 'Monadnock' behaved so well at sea," says Commodore John Rodgers in his official report, "as to inspire her officers not only with confidence, but with enthusiasm at her performance as a sea-boat. They do not doubt her ability to go anywhere." At St. Thomas she was visited by Santa Anna, ex-president of Mexico. Captain Bunce, in his report from there, says, "The engines have not stopped except in obedience to the bell. She has made an average speed of 5.85 knots per hour, the greatest distance run in any one day being 162; the least, 79.5. In scudding she behaves well, her propeller

guarding the rudder against heavy shocks. A head sea has but little effect on her. Her motion is greatest with the sea abaft the beam; but her roll, though quick and short, is easy." On her voyage to St. Thomas she consumed 213 tons of coal, or an average of 23 tons 8 cwt. daily. On the 26th of November she arrived at Salute Island, French Guiana, having made an average speed of 6.01 knots per hour on an average daily expenditure of 25 tons, 19 cwt. of coal. On the 10th of December she was at Ciara, Brazil, after a passage from Salute Island of nine days, five hours, having made an average speed of 5.34 knots per hour on a daily expenditure of 27¼ tons of coal. On the 26th of December she arrived at Bahia in company with the attending squadron, having stopped at Pernambuco; her steaming performance continued equally, and she aided her engines with extemporized sails, which added from a knot to a knot and a half to her speed. On the 3d of January the squadron arrived at Rio Janeiro, and on the passage from Bahia to Rio her average speed was seven knots on a daily expenditure of 26½ tons of coal. At Rio the emperor of the Brazils, Dom Pedro II., visited the "Monadnock." From Rio to Montevideo she averaged a speed of 7.37 knots. From Montevideo to Valparaiso her average speed was 7.1 knots. Commodore Rodgers, in his report from Valparaiso, March 2, 1866, says,—

"Any difficulties in the voyage to San Francisco which may have been anticipated are believed to end here. It would be something unusual were we to encounter any weather which an ordinary steamboat could not resist. The powers of the monitor have been much more than equal to the difficulties that we have thus far met, and the result amply vindicates the judgment of the department in directing a voyage which was generally thought perilous, but of the success of which I had no doubt. In the long seas of the Pacific to the southward of this I observed that the 'Monadnock' took very little water upon her decks, rising over the waves easily and buoyantly." Her commander, the same, reports, "The machinery has worked admirably. The passage through the Straits of Magellan and Sarmiento Channel to the Gulf of Penar presented no difficulties which were not easily overcome. I feared, in passing through the narrow places and abrupt turnings, the length of the ship would give trouble, but in practice found none whatever."

On the 25th of April the "Monadnock" arrived at Callao, Peru, and on May 13 at Panama, having stopped at Payta, with her usual average of speed and expenditure of coal. Her next stopping-place was Acapolio, in Mexico, May 29, and on the 22d of June she arrived at San Francisco. On the 28th of June, Commodore Rodgers reports, "I have the honor to announce the safe arrival of the 'Vanderbilt' and the 'Monadnock' at the navy-yard, Mare Island. The 'Monadnock' found no weather on her voyage from Philadelphia to

this place which seemed to touch the limit of her sea-going qualities. The engines have performed as satisfactory as the hull, and have arrived in complete order. The success of the voyage amply vindicates the judgment of the department in undertaking it, and the hopes of the most sanguine of 'Monitor' people are fulfilled in this crucial experiment."

Lieutenant-Commander Bunce, in his report, says, "During the recent passage of this ship from Philadelphia to this port (San Francisco) the 'Monadnock' has run by log 15,385 knots. Her average speed has been 6.32 knots. . The engines have been run about sixty revolutions per minute, that being the point judged to be most economical in fuel and in wear and tear of machinery. Not a single piece of the spare machinery has been used, and the engines are all now in good working order; they have been able to perform all work demanded of them. The vessel is an excellent sea-boat, and has received no damage from any weather we have encountered.

"In her present condition she is as perfectly safe and trustworthy a vessel for cruising in any part of the world as a vessel can be relying on steam alone for its motive-power, and twice as safe as most steamers, for she has two independent pairs of steam-engines, either of which are sufficient to keep the ship under control in any weather, and to propel her in ordinary conditions of wind and sea five knots per hour. At sea she has never needed or received assistance of any kind whatever from other vessels, and therefore I regard her, or any vessel of her class, as a thoroughly competent, independent cruiser."

Such was the successful voyage of the first turreted vessel from the Atlantic to the Pacific. It was followed soon after by the safe voyages of two single-turreted monitors to Callao, which had been sold to the agents of the Peruvian government by the government of the United States.[6]

THE "MIANTONOMOH" AND HER VOYAGE.—We now turn to the voyage of the sister ship, and her crossing and recrossing the Atlantic. The "Miantonomoh" left New York under the command of Commander J. C. Beaumont, and under the escort of the paddle-wheel steamship "Augusta" and the double-ender "Ashuelot," May 6, and arrived at Halifax on the 10th; left Halifax on the 18th, and arrived at St. John's, Newfoundland, on the 23d, and at Queenstown,

[6] The two monitors, "Catawba" and "Oneota," of 1054 tons, fitted with Ericsson's patent trunk engines, were purchased from the United States government by the agents of the Peruvian government, and added to the navy of the republic under the names of "Manco Capac" and "Atahuallpa." They arrived at Callao in May, 1870, after a prolonged voyage of eighteen months, having steamed 12,000 miles, the engines having made 4,500,000 revolutions. In latitude 44° 50′ S. in the Pacific they encountered a very heavy gale, which not only tried the strength of the ship, but its sea-going qualities. The monitors proved splendid sea-boats, their heaviest rolling being but seven degrees, while their convoy was rolling twenty-eight degrees.

Ireland, June 16, at 4 P.M., after a pleasant passage across the Atlantic of ten days, and having been in tow of the "Augusta," "as a matter of convenience or precaution" more than necessity, a great portion of the way, the "Miantonomoh" consuming a fair proportion of coal. Captain Murray, in his report, says, "I think she could have crossed over alone. Heavy weather does not appear to materially affect the speed or rolling of the monitor, for while the other vessels were lurching about, their progress being checked by heavy seas, she went along comparatively undisturbed or unchecked." On the 23d of June the "Miantonomoh" arrived at Portsmouth, England. Mr. Fox, Assistant Secretary of the United States Navy, joined her at Halifax and took passage in her to Queenstown, where he left her, being a special messenger to the emperor of Russia, bearing the congratulations of the people of the United States on his escape from assassination. He rejoined her, however, at Cherbourg, France, but left her again at Kiel. The "Miantonomoh" afterwards made an extended cruise in the Mediterranean, visiting most of the principal naval ports, and returned to the United States *via* the West Indies, arriving at Philadelphia in July, 1867, after having steamed 17,767 miles. Her performance was in every respect as satisfactory as was that of the "Monadnock." Everywhere she was an object of interest and attention. In England she was visited by the lords of the Admiralty, the Prince of Wales, the Dukes of Edinburgh, Argyle, and Sutherland, and other high dignitaries; in Copenhagen, by the king of Denmark and the royal family; and her arrival at Cronstadt with the "Augusta" was the occasion of a great naval fête. Indeed, her whole cruise in Northern Europe proved one continued ovation. At Hamburg, Rear-Admiral Popoff, the distinguished naval constructor of the Russian navy, came on board, and with his staff took passage in her to Cronstadt, and was delighted with his trip and the performance of the monitor.

The recrossing the Atlantic was accomplished under the most favorable circumstances as regards weather, but the monitor, in consequence of a foul bottom, did not behave as well, her average speed being but six and a half knots instead of seven, which was the average made during the run from St. John's to Queenstown. On both passages she was aided a greater part of the time by the tow-line of the "Augusta." From Naples to Philadelphia, a distance of 7500 miles, head winds were encountered in only two instances,—viz., on the second day out from Naples, and the day before she arrived in the Delaware.

After these two voyages no doubt remained that the larger class of monitors were seaworthy vessels, capable of crossing the Atlantic or visiting the most distant seas, when necessity required them to, though their particular province is the defense of our coasts and harbors.

The tonnage of the "Monadnock" and the "Miantonomoh," then building, is stated in the United States *Navy Register* for 1864, by the

old measurement, to be 1564 tons each. In 1866, by the new measurement, the "Miantonomoh" was 1225 tons; the "Monadnock" 1091, which infers a difference of model. They continued to be so reported until the register of 1881, where both are stated to have a tonnage of 1226 tons, and a displacement of 3815 tons.

It seems more than probable that the seaworthiness of these vessels suggested the idea of the domed and mastless steamship "Meteor," now (1882) building, which is to make a rapid transit of the Atlantic, if the expectation of her constructor and owners is fulfilled.

1866.—British Steam Invention for Ten Years Preceding.—The British Patent-Office has published a series of classified abridgments of specifications of patents in fifty-five handy volumes, which contain all the patents of the particular subjects treated in each volume that have been reported from the establishment of the patent-office up to a late date. No such index of American invention has been issued by the United States Patent-Office, and the inquirer has to search through the records of one hundred years to select what he particularly wants.

Thus the two 12mo volumes, of 333 and 340 pages respectively, "on marine propulsion, exclusive of sails," contain abridgments of every patent on that subject issued from the British Patent-Office from 1618 to 1866.

The second volume shows that during the ten years comprised between January, 1857, and December, 1866, 17 patents were taken out for air expelled to propel a vessel, 26 for air-pump to steam-engine, 26 for fire-bars to steam-engine, 163 concerning boilers, 8 for canal navigation, 5 for cranks, 119 for cylinders, 74 for condensers, 6 for vessels supported on drums, 212 for steam-engines, 75 for feathering paddles, 100 concerning furnaces, 35 for governors, 7 for gauges, 69 for hydro-propulsion, 11 for preventing the incrustation of boilers, 10 for life-boats, etc., 8 for atmospheric-engines, 4 for gas-engines, 5 for heated air, 32 for paddle-floats, 98 for paddle-wheels, 10 for submerged wheels, 340 for screw propellers, devices of various kinds, etc., 15 for refrigerators for engines, 70 concerning shafts for paddle-wheels or propellers, 3 for starting-gear, 4 for stopping vessels, 52 for steering, 4 for submarine vessels, 29 for superheating steam, 11 for towing, 27 for turbines, 71 for valve and valve gear, 3 for revolving vessels, 2 for vessel separate for engine, and many other minor inventions; and the first volume (1618–1857) contains thirty pages of index, showing quite as many more.

1867.—Steamers on Lake Memphremagog, New Hampshire.—The Memphremagog Steam Navigation Company had three steamers in 1867 plying upon that lake in New Hampshire, and two more upon the stocks. A traveler describes a trip in one of these boats to inspect another upon the stocks that year.

"Friday last," he says, "I took a trip upon the 'Mountain Maid' to Magog to inspect the new boat. She exceeds the best of the Winnipiseogee boats in her construction, in speed, and in her appointments, and will equal the largest of them in size. She is not an American boat, although American capital has been liberally invested in her. She will fly the flag of the new Dominion of Canada (supposing that to be different from the British bunting).

"The name of the steamer is taken from Mount Oxford, the highest mountain in Canada, which stands a sentinel at the outlet of the lake, rearing its pyramid almost five thousand feet from its waters. The hull is iron, the plates having been made and fitted upon the Clyde. Her length is one hundred and seventy feet; her low pressure engine has a thirty-six-inch cylinder and ten feet stroke, and is of superior finish.

"The company has purchased the 'Mountain Maid' and rebuilt her. The 'Oxford' is to make two trips a day through the lake. The 'Maid' will run as an auxiliary freight- and tow-boat."

The "Mountain Maid" being insufficient to meet the wants of pleasure-seekers, an iron steamer was built and placed on the lake. The hull was built on the Clyde. It was brought over, and the steamer completed at Magog. It is one hundred and seventy feet long, and is divided into four water-tight compartments, and is conveniently fitted up with dining-saloon and ladies' cabin. It was christened the "Lady of the Lake." It runs seventeen miles an hour, makes two daily trips between Newport and Magog, and takes three hours to make the run from one end of the lake to the other, including stops.

In addition to the "Lady of the Lake," there are a number of smaller steamers at Newport.

1869.—Steamer on the Great Salt Lake.—The "Kate Corser," the first steamer to cross the American "Dead Sea,"—the Great Salt Lake,—and employed for some time in transporting ties to the Union Pacific Railroad, in 1869 made a successful trip up Bear River to Corinne. The local newspaper says, "On nearing the city the circus band-wagon containing the band, with several other carriages, started to meet her. About one mile below she steamed to shore and took them aboard. She stemmed the current admirably, and bore up to the city like a swan, amid the sound of swelling music, the deafening boom of anvils, and the cheers of the throng upon the river's bank." Bear River was found to be perfectly free from falls or rapids; the current, however, was very strong.

Extraordinary Inland Voyage.—On the 5th day of August, 1869, the steamer "Helen Brooks" left Baltimore, Maryland, for Bayou Teche, Louisiana. She left Baltimore by way of the Chesapeake Bay, and passed through the State of Delaware by canal; up the Delaware River to Trenton, New Jersey; through the State of

New Jersey by canal; down the Raritan River to New York City; up the Hudson River to Troy; through the State of New York by the Erie Canal to Buffalo; thence by way of Lake Erie to Chicago; down through the Illinois Canal to the Illinois River; and thence down the Mississippi River, arriving at Napoleon October 14, 1869, after a circuitous journey of over three thousand miles.

THE MERCANTILE STEAMERS OF THE WORLD, 1870–74.

Nationality.	Number.			Average Size in Tons.			Tonnage.		
	1870.	1873.	1874.	1870.	1873.	1874.	1870.	1873.	1874.
American	597	403	613	861	1199	1254	513,792	483,040	768,724
Asiatic	. .	. .	6	. .	. .	576	. . . .	. . . .	3,459
Austrian	74	91	81	599	925	1025	44,312	84,155	83,039
Belgian	14	42	39	746	725	1039	10,462	30,444	40,536
British	2426	3061	3002	681	857	1005	1,651,767	2,624,431	3,015,773
Central American	. .	. .	9	. .	. .	592	. . . .	. . . .	5,332
Danish	44	71	67	275	486	582	12,085	34,498	38,976
Dutch	82	95	107	481	766	876	39,405	72,753	93,723
French	288	392	315	739	808	1012	212,976	316,765	318,757
German	127	200	220	827	1024	1222	105,131	204,894	268,828
Greek	8	8	9	408	424	592	3,267	3,390	5,329
Italian	86	103	110	423	826	827	36,358	85,045	91,011
Norwegian	26	88	112	282	473	453	7,321	41,602	51,103
Portuguese	18	17	23	729	855	802	13,126	14,536	18,452
Russian	62	114	144	458	592	771	28,422	67,522	111,072
South American	. .	. .	72	. .	. .	728	. . . .	. . . .	52,387
Spanish	148	202	212	492	686	733	72,845	138,675	155,417
Swedish	83	143	195	224	373	397	18,633	53,327	77,440
Turkish and Egyptian	. .	9	29	. .	339	949	. . . .	3,049	27,580
Various	49	109	. .	481	643	. .	23,550	70,067	. . . .
Totals	4132	5148	5365	676	841	974	2,793,452	4,328,193	5,226,888

1872.—From 1841 to 1872 fourty-four steamships, employed on voyages between the United States, England, and the Continent, were lost. Four of these were wooden paddle-wheel steamers, the remainder were iron vessels.

The "President," "City of Glasgow," "City of Boston," "Pacific," "Tempest," "United Kingdom," and "Mina Thomas" foundered at sea, and were never heard from. Between 1857 and 1864 nine iron steamers, running from the mouth of the St. Lawrence to Portland, Maine, were lost.

1867.—Petroleum as Fuel on Board Steamers.—Under authority of an act approved April 27, 1866, appropriating five thousand dollars for testing the use of petroleum as a fuel under marine boilers, an elaborate series of experiments was made at the Boston Navy-Yard on board the United States steamer "Palos," a first-class screw tug-boat of 350 tons, to ascertain the value of crude petroleum as a fuel for generating steam in marine boilers, the burning apparatus being the invention of Mr. Henry R. Foote. The steamer made a successful excursion down the harbor and back, and the experiments were continued at the wharf for several months, but the general result was not considered satisfactory. About the same time other experiments were

made at the Brooklyn Navy-Yard with the same fuel and the boilers and apparatus invented by Clark Fisher, an engineer of the United States navy. Also, among other systems of burning petroleum under the same boilers, was tried that of Mr. Simon Stevens.[7]

The conclusion arrived at was that convenience, health, comfort, and safety were against the use of petroleum in steam-vessels, and that the only advantage shown was a not very important reduction in the bulk and weight of fuel carried.

1867.—Up to 1867 the largest and fastest merchant ocean steamer built on the American continent was the "Adriatic," of the Collins' Line. The hull was 343$\frac{10}{12}$ feet long on the load-line, and her extreme breadth 343$\frac{0}{12}$ feet. Her displacement was 5233 tons.

1870.—THE "PALOS."—The first United States steamer to pass through the Suez Canal was the "Palos," fourth-rate, Commander L. A. Beardslee, which entered the canal at Port Said on the morning of August 9, 1870. Leaving it on the 11th at 7 A.M., the steamer arrived at Ismailia at 3 P.M., having been detained three hours in the "gares" waiting for steamers coming from the southwest to pass, and after several other detentions at "gares" arrived at Suez at 1.30 P.M., August 13, 1870, having been *under way* in the canal seventeen hours.

Commander Beardslee reported that the canal for its entire length at that date had a nearly level floor, with from 24 to 28 feet of water, 72 feet wide, and that a vessel drawing 16 feet had a channel 116 feet in width.

1870.—THE "HOTSPUR," the first ironclad, constructed chiefly as a ram for the royal navy, was launched in 1870.

1870.—COMPOUND ENGINES IN THE ROYAL NAVY.—The wooden screw corvette "Briton" was taken out of Sheerness harbor on the 10th of June, 1870, for a final trial of her engines and the *newly invented* plan of reheating the steam on its passage from a small to a large cylinder. The London *Times* said, "The value of the invention was amply proved; the trial having finally disposed of the long-vexed question as to the best means of economizing fuel in steamships." The "Briton" was kept in full speed for four consecutive hours, the engines making seventy-seven revolutions, the speed being over twelve knots, and the consumption of coal only 1.3 pounds per horse-power per hour, the average consumption of coal on her Majesty's steamers having before ranged from 3 to 4 pounds per horse-power per hour. A previous trial of the "Briton" had not been so successful.

1871.—COMPOUND ENGINES IN THE UNITED STATES NAVY.—This year Chief-Engineer J. W. King, U.S.N., made a strong report in favor of compound engines, in which he stated that the Fairfield Works on the Clyde had completed one hundred and thirty *pairs* of

[7] See Report of Secretary of the Navy, December 2, 1867. Report of the Chief of the Bureau of Steam Engineering.

compound engines, and had then, at the time of his visit, twenty-two pairs under construction, all for ocean steamers. That firm or company was then regarded as the pioneer of the compound system, and its productions were accepted as the best types.[8]

In consequence of this favorable report, the Honorable Secretary of the United States Navy ordered all new vessels and those requiring new engines to be fitted with those of the compound type.[9] In December, 1872, Chief-Engineers Charles H. Loring and Charles H. Baker made a very strong report to the Secretary of the Navy in favor of compound engines.

1872.—FUEL-SAVINGS EXPERIMENT.—In 1872 a discovery was made by which the cost of steam-power, it was claimed, was reduced sixty per cent. It was put into practical operation at the Atlantic Works in Boston. By a novel process the great amount of heat that escapes into the air in the waste or exhaust steam from engines is utilized by conducting it through the tubes of a boiler filled with the bisulphide of carbon, "a fluid which boils at 110° F., and at the temperature of exhaust steam gives a pressure of sixty-five pounds to the inch in the boiler;" the vapor formed in this boiler is used to drive an engine, instead of steam, and after being used, is condensed by cooling, pumped into the boiler again, and used continuously without loss.

Careful experiments proved that the fuel required to produce one hundred horse-power with the best engines then in use would by this process produce two hundred and fifty horse-power, a gain of one hundred and fifty per cent. in the power obtained by the same consumption of fuel.

For making a careful test of this process, two new engines of the same size and construction were put up at the Atlantic Works. One was run by steam in the usual manner, while the heat that escaped in the exhaust from this engine was used to heat a boiler and drive the second engine. A careful measurement of the power produced by each of the engines showed that while the first engine, worked by steam in the usual way, produced 6.23 horse-power, the second engine, worked entirely by the waste heat escaping in the exhaust from the first, produced 9.12 horse-power, the two together producing 15.35 horse-power with the fuel required to drive the steam-engine alone.

The coal required to run a steam-engine of one hundred horse-power, of the best class in use, is about four thousand pounds per day, or six hundred tons a year. It was claimed by this discovery that the same engine could be run with sixteen hundred pounds of coal per day, or two hundred and forty tons per year, saving three hundred and sixty tons of coal a year for each hundred horse-power produced.

[8] Report of J. W. King, U.S.N., Chief of Bureau of Steam Engineering, to the Secretary of the Navy, October 30, 1871.

[9] See Secretary of Navy Report, 1872.

For steam-vessels the advantages of this process would be greater than for stationary engines, as a large amount of room occupied by coal would be saved, and could be used for freight. The vessel could also carry fuel to last through a much longer voyage, enabling steam- to compete with sailing-vessels on long voyages advantageously.

1873.—THE CABLE STEAMER "FARADAY."—This vessel was built in 1873 for laying Atlantic cables. She is 366 feet in length, has 52 feet beam, is 36 feet in depth, and measures 5000 tons gross, but can carry 6000 tons dead weight. Her iron hull, in addition to the requirements of "Lloyds," was enormously strengthened to fit her for the service for which she was built. She is fitted with three cable tanks constructed of plate-iron, which form a series of double arches supporting the sides of the vessel. These tanks are united together and to the general fabric of the hull by five iron decks. The vessel is doubled-bottomed, the space between the two bottoms being a net-work of iron girders for carrying the cable tanks, and at the same time giving longitudinal strength to that portion of the hull. The space is further utilized for carrying water ballast, to trim the vessel as the cable is run out, and to enable her to make a voyage across the Atlantic without cargo or other weight beyond fuel. In outward appearance the "Faraday" is unlike other ocean steamers, her bow and stern being of the same form, and she is fitted with a rudder at each end. She has two surface condensing engines, each working a separate screw. The object of this arrangement is to obtain increased steering or manœuvring power, which is a very important condition in cable laying.

1875.—THE DOUBLE-HULL "CASTALIA."—To provide ample accommodations for all classes of passengers under shelter as well as on deck, to reduce the motion of rolling and pitching to a minimum, and to keep the draught to six feet, so that the steamer could enter the channel ports on both sides at every state of tide, the "Castalia" was built at the Thames Iron Works. She may be roughly described as the two halves of a longitudinally divided hull, 290 feet long, placed 26 feet apart, and strongly bound together. Under this deck worked a pair of paddle-wheels, *side by side*, on two separate shafts, so that each wheel could be worked independently by two pairs of engines, one pair on each half of the vessel. The division of the hull provided a deck *sixty feet* wide. Before and behind the engine were state-saloons enclosed by the hurricane deck running the whole width of the vessel. There were also decks below running fore and aft to within a few feet of the double bow in the separate hulls. The "Castalia" had accommodation for one thousand passengers.

A correspondent of the London *Times* says of this steamer,—

"Returning from our autumnal tour, we determined to give the 'Castalia' a trial. The weather was unusually boisterous; at Calais it

was difficult to stand against the gust of wind which swept across the pier. Outside, the sea ran high, and the usual discomforts of the passage presented themselves to us. The 'Castalia,' when she left the pier, seemed to glide to the turbulent waters outside. For a moment it puzzled one to find the deck as firm and level as a dinner-table, and yet waves breaking all around. We performed the passage to Dover in about two hours and a quarter; the motion was very slight indeed, about as much as in the ordinary steamers after they get within the harbor of Dover or Calais,—every few minutes there was one single roll of about three degrees. There was no tremulous motion from the paddles. I explored the saloons for indications of straining, but found none; the surface of the paint was without a shadow of a crack, and throughout the passage there was no creaking noise. When we arrived in Dover the decks before and aft of the funnels were as dry as when we left Calais. The sea was enough to try the regular steamers, but on board the 'Castalia' children were playing about, every one was perfectly comfortable, and I can safely state that it is the first time I ever crossed the Channel without seeing a sign of sickness."

1875.—THE "BESSEMER."—This vessel was constructed for the Channel service to combine great speed, a light draught, and the least possible rolling and pitching motions, and to afford passengers crossing the Channel the quickest transit with the greatest amount of ease, at an immersion so small that the vessel could enter the existing English and French harbors at all times of the tide. The "Bessemer" was designed by E. J. Reed, ex-constructor to the royal navy, with the exception of her anti-seasick swinging saloon, which was the invention of Mr. Bessemer. The vessel was so novel in her construction as to be an object of great interest. She was three hundred and fifty feet long at the water-line, and forty-eight feet at each end; the deck was only four feet above the line of flotation, so that in rough weather the sea would wash over these low ends. The decks on this portion of the vessel had a considerable curve, and the sides of the ship were rounded off so that the water might escape. This form of end was selected to obviate any tendency to pitching. Above these low decks was a breastwork eight feet high, two hundred and fifty-four feet long, and all the width of the vessel. The whole of this breastwork deck was for the use of the passengers, and portions fore and aft of the paddle-boxes were protected with stanchions. The vessels were propelled by *four* paddle-wheels, and ninety feet of space between the paddles was occupied by the swinging saloon. Beyond this and at each end the space nearest the saloon was occupied by the engines and the boilers. At one end of the breastwork there was accommodation for the crew, and beneath their quarters stowage-room for passengers' luggage, etc. At the opposite end of the breastwork the space was fitted with cabins for the ladies, and below these cabins was a saloon fifty-two feet long, fitted

with sofa seats all around. Along the sides of the breastwork deck, between the paddle-boxes, were other cabins, smoking- and refreshment-rooms. The "Bessemer" swinging saloon was about seventy feet long, thirty-five feet wide, and twenty feet high. The weight of the saloon was borne by four large bearings, one at each end and two near the centre. The end bearings were fixed on iron transverse bulkheads, which were well-stiffened by fore-and-aft ways to prevent their buckling. The saloon was a superbly-fitted apartment. The top of it formed a promenade-deck, and was fitted all around with seats. The saloon was entirely under the control of machinery invented by Mr. Bessemer, and it was expected that the passengers would not feel any more unpleasant sensation than they would in going up or down the Thames.

The swinging saloon was in the centre of the vessel, and was entered by two broad staircases leading to a landing connected with the saloon by a flexible flooring. The aftermost of the two central supports was hollow, and served as a part of the hydraulic machinery for regulating the motion of the saloon.

The nominal horse-power of the engines of the "Bessemer" was 750, but they could be worked up to an indicated power of 4600, and were calculated to drive the vessel at a speed of from eighteen to twenty statute miles an hour. The paddle-wheels, one hundred and six feet apart and twenty-seven feet ten inches in diameter, were fitted with twelve feathering floats.

May 8, 1875.—The "Bessemer" crossed from Dover to Calais and back again, when her speed was about the same as the ordinary boats.

THE "CALAIS-DOUVRE."—Another twin boat for crossing the Channel between England and France, called the "Calais-Douvre," in some respects an improvement on the "Bessemer," has been built and is in successful service. Her length is three hundred and two feet; breadth over all sixty-one feet; depth, thirteen feet nine inches; water-space between the hulls, twenty-four and a half feet; draught, seven feet; speed, fourteen and a half to fifteen knots. The diameter of her cylinders is sixty-three inches; stroke of piston, six feet; cut-off, three-tenths of stroke; revolutions of her paddle-wheel, thirty-five per minute; steam pressure, thirty pounds; diameter of wheel, twenty-four feet; beam of each hull, eighteen feet three inches; horse-power, 3600. She was built at Newcastle-upon-Tyne.

1875.—HIGH-SPEED BOATS IN RUSSIA.—In 1875 a high-speed boat was built at St. Petersburg on an improved plan, whose outer hull was made entirely of Muntz metal, it being cheaper than copper as a sheathing for wooden vessels. In a trial with one of the fastest boats she was victorious, and accomplished nineteen miles per hour, the engines making an average of nearly six hundred revolutions per

minute, working with steam at one hundred pounds per square inch. This vessel is described as forty-eight feet long at the load-line, having six and one-half feet beam, and three and one-half feet depth of hold, while her mean draught was one foot nine inches. She had compound engines of superior workmanship in every respect, which drove a screw two feet nine inches in diameter, having three feet four inches in pitch.

1876.—THE "IONA."—The "Iona," a paddle-wheel steamer employed in the passenger traffic between Glasgow and the Western Highlands, had cabin accommodations for twelve hundred passengers, and her long range of saloon-houses, with plate-glass windows fore and aft, gave her a graceful appearance. Her dimensions were: Length, 250 feet; beam, 25 feet. She was propelled by a pair of oscillating engines with a continued nominal power of 180 horses. Her draught, when fully laden, did not exceed six feet, and her speed under favorable circumstances was from twenty to twenty-one miles per hour. She was the fastest steam-vessel in Great Britain, and, one or two steamers of the United States excepted, in the world.

1878.—THE "IRIS."—There was in the British navy in 1878 a man-of-war capable of steaming twenty-one miles an hour. She was a vessel named the "Iris," of nearly four thousand tons measurement, having a nominal speed of seven thousand horse-power. When fully equipped and armed she may not have been so fleet, but the surprising speed realized at Portsmouth was not considered the maximum that the "Iris" was capable of making. A previous trial of the ship's engines had not been so satisfactory. At that time a huge, four-bladed screw was fitted, and the improvement in the fleetness of the vessel was due to reducing the surface of the screw, and employing two blades instead of four. The engines, powerful as they were, had been overweighted by the screw.

The "Iris" was the forerunner of a steel flotilla of six corvettes and two dispatch-boats of a similar character.

By employing steel in lieu of iron, it has been possible to construct much lighter craft, with finer lines to the vessels, without sacrificing their strength and solidity. The steel corvettes are to be fleet boats, but have the high speed of the "Iris" or the "Mercury." They are intended for swift cruisers, and, though comparatively lightly armed, each of them have a pair of 7-inch or armor-piercing guns. They are named, respectively, "Carysfort," "Champion," "Cleopatra," "Comus," "Conquest," and "Curaçoa." The "Iris" and the "Mercury" armaments consist of sixty-four pounders; but their speed is such that they will always have the option of fighting or running away.

1878.—STEAMBOATS IN COREA.—A steamboat built by the Coreans is thus referred to in the *North China Daily News* of March 28, 1878:

"Everything European, just because it is so, is despised, but the

Coreans try hard to originate wonderful undertakings. For about eight months they have been working at a steamboat, and some ten thousand *taels* have been used up. There is the shell with three keels, which makes the thing rather flat. The bow is sharp, and there are port-holes for cannon; a smoke-stack, which has been observed at work, but the wheels are wanting. Meanwhile, for fear the Japanese might benefit by the sight, this masterpiece was covered in with a wooden frame. Ten years ago they made an iron vessel, but it unfortunately sunk when launched."

1879.—THE "DURBIN."—The fastest long-distance voyage on record was made by the steamer "Durbin," with telegrams from Zululand to England, in 1879. She left Table Bay a little before 8 P.M., and averaged 298 miles a day to Madeira, where she stopped April 14 for four and a half hours. She made Plymouth at 6 P.M. on April 20. The entire distance, about 6000 miles, was run at an *average of* 13.1 *knots*. Faster speed has been made across the Atlantic, but this is the best for so long a distance.

1879.—STEAM *vs.* SAILS.—At the end of the year 1879 there were registered as belonging to the United Kingdom, including the Channel Islands, 20,538 sailing-vessels, of 4,068,742 tons, and 5027 steam-vessels, of 2,511,733 tons, making in the whole 25,565 vessels, of 6,579,795 tons, being 24,811 tons more than at the end of the year 1878.

The numbers for 1879 compared with those of 1866 show in the fourteen years a decline of 5602 in the number of sailing-vessels, and of 834,910 tons in the tonnage; and in steam-vessels an *increase* of 2196 in the number, and of 1,635,548 tons in the tonnage.

The shipping belonging to the United States on the 30th of June, 1879, was classified as follows: 17,042 sailing-vessels, of 2,422,813 tons; 4569 steam-vessels, of 1,176,172 tons; 2394 barges, of 466,878 tons; and 1206 canal-boats, etc., of 103,721 tons; total, 25,211 vessels of all kinds, and tonnage, 4,169,584 tons.

How rapidly steam has superseded wind as the motive-power of ships on the Atlantic is shown in the statement of exports of grain in bushels from New York, from January 1 to October 31, for five years, —viz.:

Year.	Steam.	Sail.
1878	28,151,191	47,493,409
1879	33,847,952	52,046,703
1880	43,955,065	57,203,079
1881	46,212,288	17,738,421
1882	34,500,000	5,200,000

1879.—THE "SOLANO."—The largest ferry-boat in the world was given a trial December 1, 1879, at San Francisco, and behaved satisfactorily in every respect. The "Solano" was built for the transpor-

tation of passenger- and freight-cars across the Straits of Carquinez from Port Costa to Benicia. Her dimensions are: Length over all, 424 feet; length on bottom (she has no keel), 406 feet; height of sides in centre, 18 feet 5 inches; height of sides on each end, from bottom of boat, 15 feet 10 inches; molded beam, 64 feet; extreme width over guards, 116 feet; width of guards at centre of boat, 25 feet 6 inches; reverse, sheer of deck, 2½ feet. She has two vertical-beam engines of 60-inch bore and 11-inch stroke, built at Wilmington, Delaware. The engines have a nominal power of 1500 horses each, but are capable of being worked up to 2000 horse-power each. Upon the deck of the "Solano" are *four railroad tracks* extending her entire length, with a capacity of carrying forty-eight loaded freight-cars, or twenty-four passenger-coaches of the largest class. Her four rudders are worked by an hydraulic steering-gear, operated by an independent steam-pump. They are also connected with the ordinary steering-gear, so that, in case of any disarrangement of the hydraulic apparatus, the vessel may be guided by it. The advantage is that this immense craft can be handled by one man, whereas, if the ordinary wheel and system of steering were used, six men would be required at the wheel.

1880.—CHINESE ENTERPRISE.—In 1874 fifty British steamers were profitably engaged in the local trades in Chinese waters. That year the natives organized the China Merchants' Steam Navigation Company, with the imperial consent and support. The first year the company had six steamers in operation. The next year four were added, and in 1877 the company's fleet numbered sixteen vessels. A fierce competition was waged with foreign companies, during which rates were cut from fifty to seventy per cent. of the former amounts. The result was that the foreign "Shanghai Steam Navigation Company" was killed, and its twenty-six vessels and wharf property were bought by the native company. The aggressive policy thus begun has been continued, until now the Chinese look to a general navigation of the high seas, and in August, 1880, the "Hongchong," one of the original six vessels of the China Merchants' Company, entered the harbor of San Francisco. China enjoys the cheapest labor on the planet; has enormous coal-fields and large iron deposits; and a firm of British builders have decided to transfer their capital to China, with a view to beginning the work of ship-building, for which so abundant materials and advantageous conditions for labor exist. Japan is acting with like vigor, and has already several steam lines in operation.

1880.—A REMARKABLE VOYAGE OF A WRECKED STEAMER.—On July 14, 1880, the Chilian transport "Rimac," an iron screw-steamer of twelve hundred and twenty-seven tons, carrying a regiment of cavalry and a valuable cargo, was captured by the Peruvian corvette "Union" and taken to Callao. After the Peruvian defeat at Chorillos and Miraflores the "Rimac" was burned and sunk. The hulk was

raised by the Chilians, and, although severely damaged, it was found that it could be rendered serviceable, and that the machinery was only slightly injured. Every particle of wood-work was burned out of her, and she presented more the appearance of an empty fire-worn stove than of a vessel with which the sea could be navigated. The deck-beams were cracked and twisted as if they had been thin iron wires; some stanchions still stood upright, but more had assumed shapes which would have astonished any ship-builder, and the bulwarks were bulged in and out, and shriveled as if they had been run through some powerful crimping-machine. Damaged as she was, it was the desire of the Chilian government, whose prize she had become, and of the South American Company, who had become her purchasers, that she should be taken back to Chili, and Captain James Hart was called upon for an opinion as to the possibility of taking her to Chili. He reported favorably, although declaring there was much risk, and the voyage was agreed upon. Only the most absolute and trivial repairs were effected, and, after the sides had been boarded up to prevent her filling, this damaged iron tank—for it could scarcely be called a vessel—took its departure from Callao. The machinery worked well. But as the engines were intended to drive a heavy vessel, and they were now employed in propelling a light and unladen hull, they were too powerful for their work. They drove it along at a good speed, it is true, but the vibration caused thereby was severe in the extreme. Very heavy weather was encountered, and, as the vessel would dip into the sea so it would strike her abeam, the water would rush into the hold, threatening to swamp her, and keeping the pumps constantly at work. All hands were wet through the entire trip, no cabins having been put up. Several of the damaged deck-beams broke, through the severe straining of the sides, and one day the remains of the bridge tumbled into the hold, carrying with it the binnacle and the wheel, which had been temporarily fixed up. The compass was useless, it being impossible to place reliance in it owing to the vibration causing the needle to revolve the whole time. Steering was done by guesswork, the direction of the sea, which runs from the southward, and the heavens serving as a substitute. The voyage fortunately was performed in safety, and the wreck was finally moored to Valparaiso. The distance from Callao to Valparaiso is fifteen hundred and fifty-eight miles, head to wind all the time. The "Rimac" is now being repaired, and within a few months she will be again ready for sea.

1880.—THE "COMET" ON LAKE BIGLER.—A new pleasure-steamer, called the "Comet," was built for Lake Bigler in 1880. It was exclusively for the use of passengers and pleasure-parties, and made the trip around the lake in a day. It was fitted up in splendid style.

1880.—THE "THREE BROTHERS."—In 1880 the well-known

American ship "Three Brothers," formerly the steamship "Vanderbilt," and the largest sailing merchant-vessel afloat, was sold to merchants in Liverpool for eight thousand pounds, and she will hereafter sail under the British flag.

1880.—A MOUNTAIN STEAMER.—Steam navigation among the mountain ranges of Colorado is one of the peculiarities of that wonderful region. A Denver paper says, "A sail over the placid and translucent waters of Twin Lakes will convince the traveler that Colorado affords some of the most beautiful aquatic scenery in nature. Twin Lakes are located three miles from Twin Lake Station, Denver and South Park Division, Union Pacific Railway, or one hundred and fifty-seven miles southwest of Denver, at the eastern base of the Sawache Range, at an elevation of nine thousand three hundred and thirty-three feet above the level of the sea. The lower lake covers fifteen hundred and twenty-five, and the upper four hundred and seventy-five acres, and they are united by a small, swift, clear stream, about half a mile in length, which winds through grassy meadows studded with scattering shade-trees, affording delightful picnic- or camp-grounds. On the north stands Mount Elbert, fourteen thousand three hundred and sixty feet above the sea, or five thousand and twenty-seven feet above the lakes. Directly opposite (at the south side of the lakes) are the Twin Peaks, also giants of the Rocky chain. The sheets are, therefore, thoroughly mountain-locked." The paper above quoted says the little steamer plying on Twin Lakes "has the distinguished honor of being nearer to heaven than any other craft in the wide, wide world."

SHIPS THAT WERE NEVER HEARD FROM.—The following European steamers have never been heard from after leaving port: The "President," sailed from New York, March 11, 1841; had among her passengers Tyrone Power, the famous Irish comedian, and a son of the Duke of Richmond. The "City of Glasgow," never heard from after leaving Glasgow in the spring of 1854; four hundred and eighty lives lost. The "Pacific," never heard from after January 23, 1856, when she left Liverpool; two hundred lives lost. The "Tempest," never heard from after she left New York, Feburary 26, 1857. The "City of Boston," left New York January 25, 1860; about one hundred and sixty lives lost. The "Ismailia" left New York, September 26, 1878, and was never heard from.

1880.—A CANAL-BOAT PROPELLED BY AIR.—A novelty in canal-boats in Charles River, Massachusetts, attracted considerable attention in 1880. It was called a "pneumatic canal-boat, and was built at Wiscasset, Maine, as devised by the owner, R. H. Tucker, of Boston, who held patents for its design in England and the United States. The boat shown on Charles River, designed to be used on canals without injuring the banks, was a simple structure, sixty-two feet

long, twenty feet wide, three feet in depth, and drew seventeen inches of water. It was driven entirely by *air*, Root's blower No. 4 being used, and was operated by an eight horse-power engine. The air was forced down a central shaft to the bottom, where it was deflected, and, being confined between the keels, passed backward and upward, escaping at the stern through an orifice nineteen feet wide, so as to form an air wedge between the boat and the surface of the water. The force with which the air struck the water propelled the boat at a speed of four miles an hour, but required a thirty-five horse-power engine to develop its full capabilities. The patentee claimed a great advantage in dispensing with the heavy machinery of screws and side-wheels, and believed that his contrivance gave full results in proportion to the power employed. It was also contrived for backing and steering by air propulsion. Owing to the slight disturbance it caused to the water, it was thought very well adapted for work on canals.

1880.—THE FIRST CHINESE STEAMER TO CROSS THE PACIFIC. —On the 31st of August, 1880, the Chinese steamer "Hochung" entered the custom-house of San Francisco, California, paying the regular tonnage dues of thirty cents per ton, and one dollar per ton extra dues on alien ships, the latter under protest. Extra duties of 10 per cent. on the cargo were also paid under protest, and the whole matter was referred to the decision of the Secretary of the Treasury. She was also the first Chinese steamer that ever visited the Hawaiian Islands in November, 1879, and carried to Honolulu 431 Chinese immigrants.

A San Francisco paper said of this arrival, under the heading, "China's Début upon the Sea,"—

"The arrival at San Francisco on the 30th of August of the first Chinese steamer that has ever crossed the Pacific deserves commemoration. This steamer, the 'Hochung,' appeared at the Golden Gate, seeking admission to a foreign port, nearly forty years after the isolation in which for ages China was encased was broken and five of her ports were opened to the commerce of the civilized world. The treaty of 1842, by which this concession was secured to foreign trade, has borne fruit slowly; but the tardiness of the Chinese to undertake maritime enterprises is due not so much to their love of seclusion as to the difficulty of acquiring the art of navigation. This art is, and ever has been, one of the later acquisitions of nations. . . . It is no wonder, therefore, that the Chinese have taken forty years to master the nautical skill requisite for the accomplishment of this feat. But the beginning of ocean traffic is now made; and this field of commercial competition once fairly broken, there is reason to hope the Orientals will find it profitable. . . . In this maritime enterprise they are favored by the immense coal-supply of the Middle Kingdom. Baron Richthofen, who carefully examined the coal-fields of China, says it is

'among the most favored countries of the world as regards the distribution of mineral fuel.' This able geographer computes from his own inspection that the 'quantity of very superior coal available for cheap extraction is so large that, at the present rate of consumption, the world could be supplied from Shansi alone for several thousand years.' This vast coal-bed is reached by the Yang-tse-Kiang (river), China's great commercial highway, navigable for large vessels twelve hundred miles from its mouth, and easily ascended by ocean steamers as far as Hankow, seven hundred miles from the sea. With such magnificent deposits of mineral fuel suited for use on steam-vessels, the day is not distant when the Chinese, renowned for ages as dexterous mechanics, will be able with a little nautical training to carve out a bright maritime future for their nation."

A telegraphic dispatch, dated London, December 7, 1881, announced that "the 'Meefoo,' the first of a regular line of steamers under the Chinese flag, arrived in the Thames with three thousand tons of tea." [10]

1880.—TWIN GAIN SCREWS.—Mr. John Taggart, of Boston, in 1880, invented a method of propelling steamers by two screws, differing in almost every particular from the ordinary propeller. These screws are described as long, hollow, iron cylinders, with what are called "gain" screws with two threads. The threads are near together at the bow, and gradually diverge towards the stern, thus giving them the name of *gain* screw. It is claimed a great power is gained by this means at once at the bow, and the gradually-increasing width between the threads diminishes to a great extent the friction and dead weight of the water. The cylinders, being hollow, are very buoyant. The journals of these cylinders run in strong yokes projecting from the iron heel at the bow and stern. These cylinders are run by an endless chain. The threads are large, and answer to the blades of a propeller, but, having a greater surface, give an increased power. It is claimed that with these screws a river-boat could be run at the rate of *thirty-seven miles an hour;* that a tug thus equipped could, with engines of the same power, pull ordinary tugs backward, and that an ocean steamer could cross the Atlantic in four and a half days. A practical test of the invention is proposed by building a tug on this new plan.

1880.—The tonnage and value of the steamers of the mercantile navy of Great Britain in 1880 was,—

	Tons.		Value.
Under 500 tons	339,505	£12	£4,074,060
From 500 to 2000	1,913,445	20	38,268,900
From 2000 upward	341,184	25	8,529,600
Total	2,594,134		£50,872,560

[10] Are not the Chinese now in advance, considering that we, who claim to hold the most advanced opinions of the age, exclude their emigrants under the recent shameful act of Congress?

This was the value of the vessels completely fitted and provisioned for sea, with allowance for the average of the various ages in the different classes.

1880.—THE "ANTHRACITE," the smallest steamer that ever crossed the Atlantic, arrived at New York in August, 1880, and went thence to Philadelphia. She sailed from the latter port on the 23d of August, and arrived at Falmouth, England, September 14, after a voyage of twenty-two days and fourteen hours. She steamed three thousand three hundred and sixteen miles, doing the entire distance with the consumption of less than *twenty-five tons of coal*, steaming thirteen hundred and fifty-three miles with only nine tons. The "Anthracite" had a new system of boilers, which, her inventor claimed, would revolutionize the utilization of steam for propelling vessels.

The "Anthracite" was built expressly for this Atlantic voyage, to show that the difficulty previously encountered in vessels with high-pressure engines of retaining steam could be overcome by substituting for ordinary piston-packing a metal peculiar to the Perkins system. Economy in expenditure of heat and water was also claimed.

Of the "Anthracite's" eighty-four feet of length, her engines, furnaces, and boilers take up a space of twenty-two feet six inches, leaving a hatchway, kitchen, and forecastle-cabin in the forepart of the boat, and a water-tight bulkhead. Abaft the engines are three cabins, with sleeping-bunks, with a water-tight bulkhead in the stern. The screw is of the ordinary fish-tail pattern, with two blades. Her gross tonnage is 70.26 tons, and her registered tonnage is 27.91 tons. Her average consumption of coal on the voyage from England to Newfoundland and thence to New York was one ton of Welsh bituminous coal a day. The weather was very rough, consequently the sails could be little used. The counter registering the revolutions of her screw was set at 0 before she left England, and on arrival at New York marked three million nine hundred and eighty thousand. In the voyage over the natural draught of the furnace only was used, but she has a fan-blower, which can be brought into use if increased consumption of fuel and a high pressure of steam are desired.

The peculiarity of the machinery which effects the economy of fuel lies in the means employed for using steam at very high pressure safely, and without undue wear and strain. The average boiler pressure on the voyage over was from *three hundred and fifty to four hundred pounds to the square inch, but the boilers had been tested up to two thousand five hundred pounds per square inch* by hydraulic pressure. The body of the boiler consists of a series of horizontal tubes, welded up at each end, and connected together by a vertical tube, and the several sections are connected by a verticle tube to the top ring of the fire-box, and by another to the steam-collecting tube. The fire-box is formed of tubes bent into a rectangular shape. The boiler is sur-

rounded by a double casing of thin sheet-iron, filled between with non-conducting material to prevent loss of heat. The cylinders and valve-boxes are steam-jacketed, and further protected by jackets of non-conducting material, so that, although all the parts are kept at a high temperature, the heat given out in the engine and fire-room is much less than is usual in ordinary marine engines.

The difficulty from friction and imperfect joints in practically working machinery at high pressures was one of the serious obstacles encountered in developing this system. After a series of experiments, the inventor adopted an antifriction alloy, of which the packing-rings and internal rubbing surfaces are made. No lubrication is required beyond that furnished by the steam. He states that cylinders fitted with piston-rings made of this metal have been several years at work, showing no signs of wear, the only wear occurring on the rings, which can be easily and cheaply replaced. Not only is the cost of oil and grease saved, but the destructive action on the machinery and boiler of the acids generated from lubricants is avoided.

For the use of steam at these high pressures three different-sized cylinders are employed, all jacketed with spiral tubes cast in the metal, which are supplied with steam direct from the boilers, and keep up the temperature of the cylinders. The cylinders are arranged one above the other, and their pistons are connected to a common piston-rod. The operation is thus described by Mr. Loftus Perkins, the inventor, in a paper read before the Institution of Mechanical Engineers, London:

"The high-pressure steam is introduced into the upper end of the first cylinder, where there is no gland, and where the piston is formed so as to require no lubricating material. The steam is cut off at half-stroke in this cylinder, and when admitted for the return-stroke into the bottom of the second cylinder, of four times the area, the temperature is so much reduced as to cause no difficulty when brought into contact with the piston-rod gland. From the bottom of the second cylinder the steam expands into the top of the same cylinder, which is of larger capacity than the bottom, and serves as a chamber, and is in direct communication with the valve-box of the third cylinder. This last is double-acting, and is arranged to cut off at about a quarter-stroke, and at the termination of the stroke exhausts into the condenser, with an expansion of about thirty-two times."

It is some years since Mr. Perkins began to advocate the merits of this system, and he has taken out many patents connected therewith, but the difficulties attending its practical working, and the disposition to oppose it by those who had large sums invested in old style machinery, have, it is asserted, prevented its general adoption, although in several cases in England it has been successfully introduced. The boilers and engines of the "Anthracite" contain all the latest improve-

ments of the inventor, and are thought to afford a practical demonstration of the entire success of the Perkins system, and show how all stationary and marine engines can be run at an expense of less than one-half the present cost for fuel.

Two and a half pounds of coal per horse-power per hour is considered very economical running, and some of our best-managed ocean steamers use one hundred tons of coal a day in their voyage. To demonstrate the practicability of reducing this more than one-half, thereby not only saving the cost of fuel, but giving more space for freight, was the purpose of the visit of the "Anthracite" to American waters.

1880.—First Steamboat on the Upper Delaware.—The steamboat "Kittatinny," the first that ever reached Port Jervis, New York, arrived at Delaware Water Gap April 28, 1880, without accident, having run the fifty miles in less than five hours. This steamboat was sixty feet long, fourteen feet wide, and carried seventy persons, the navigation of the Upper Delaware being thus proved feasible by steam. Great excitement prevailed throughout the region traversed, and hundreds of persons flocked to see the boat.

1881.—The "Harriet Lane."—The United States revenue steam-cutter "Harriet Lane," built in 1859 for that service, was placed at the disposal of the Prince of Wales during his visit to this country, and at the outbreak of the Rebellion was turned over to the Navy Department. On New Year's night, 1863, her decks were the scene of one of the most desperate hand-to-hand encounters of the war, when her captain and first lieutenant were killed. Transformed into a sailing bark, and named the "Elliott Ritchie," this famous craft was peacefully lying at Philadelphia awaiting a cargo, December 10, 1881.

1881.—The "Dessoug."—The steamer "Dessoug," which conveyed Cleopatra's Needle from Egypt to New York, was built in England, and was for years used as a trader until the Khedive of Egypt bought and converted her into a yacht. Purchased for the purpose of bringing the obelisk to America, she was sold and altered and rebuilt as a freight steamer for the New York and Savannah cotton trade.

George H. Preble,
Rear-Admiral U.S.N.

(To be continued.)

AMONG OUR CONTEMPORARIES.

In noticing an address upon the subject of Service Signaling (visual), the London *United Service* says, "That there is both the room and the need for an improved system of signaling is evidenced by a report, to which Major Harrison alluded, of an examination in signaling in the army. In this the best record given is that of a troop of Royal Engineers, who scored ninety-eight per cent. of signals read correctly, and the lowest (the major advisedly took care to forget who they were) came out with but fifty per cent. read correctly. There are certainly objections to the Morse system as applied to anything but the telegraph instrument to be read by the ear. The eye is far slower than the ear in the rate at which it can receive successive impressions, and it is questionable whether any man of average ability can possibly learn visual Morse signaling with any useful results after the age of thirty. We think there is justification for the estimate formed by Major Harrison that, taking a hundred men—not picked, but at random—from a regiment or from a ship, there would be found at the end of three months average training hardly more than ten of them capable of sending and receiving such signals with a reasonable degree of accuracy and rapidity. In fact, Colonel Keyser, inspector of signaling, has admitted that out of twenty men selected from a regiment as fit and proper material for training into signalers, only three as an average attain that position; that is to say, after fifty working days of training the waste is eighty-five per cent. of the material. This large proportion of failures is in itself a strong argument against the use of the dot-and-dash system for visual signaling. It is clearly impossible to lower the standard, because a man must signal properly or not at all.

There are many old soldiers and sailors who served during the Rebellion, on our Southern Atlantic coast, who will remember with interest the "Swamp Angel" battery, which was able, from its position in the morass at Morris's Island, to throw a shot into Charleston,—the "hot bed of rebellion," as it was then called. The infinite labor, pains, and trouble necessary to form the platform in such a situation, and then to convey the gun to it has been told, circumstantially, in

the "Official Records," but few of those who know of those labors could tell where that gun is now. We therefore quote a correspondent of the Philadelphia *Ledger*, who writes from Trenton, New Jersey, and says, "Where Broad and Clinton Streets intersect, the famous 'Swamp Angel' cannon from Charleston Harbor is now doing peaceful duty as an ornament for a drinking fountain. It is a plain and rather uncouth-looking gun, about ten feet long, appearing very rudely constructed in contrast with the elongated and tapering heavy rifled cannon made to-day, and is mounted on top of a cubical pile of brown stone. This was the most noted gun of the late Civil War, the earliest kind of heavy and long-range ordnance produced by the necessities of that great struggle, which so unexpectedly revolutionized the gunnery and fortification systems of the world. It is an eight-inch Parrott rifle, or 200-pounder, and when fired carried a 150-pound projectile seven thousand yards, from a battery on Morris's Island into the city of Charleston, then regarded as a prodigious achievement."

This gun is a muzzle-loader, weighing about eight tons, and burst, after firing thirty-six rounds at Charleston, in August, 1863, the fracture being plainly visible around the breech.

Carlyle and other writers have given interesting details concerning the gigantic grenadiers of King Frederick William, and of the means (force, fraud, and money) by which their ranks were filled. Author of the most despotic military system known, even in those despotic times, he was not a bad king when his hobby was not interfered with. Mr. W. M. Torrens, in his recently published work, "The History of Cabinets," contributes an anecdote about old Fritz's giants which we do not remember having met with before. He says,—

"One of Carteret's first official instructions was to request the Viceroy of Ireland to have sixteen able-bodied grenadiers of more than uncommon height recruited, wherewith George I. wished to make a gratification to his brother-in-law of Prussia, who was known to have an admiration for giants, and was not particular where they were bred. Voltaire tells how he had them from various climes, and a specimen from the Isle of the West would be a valued variety. 'His Majesty would have conveyance for them by sea from Dublin to Hamburg, where Prussian officers must be ready to receive them.' On further deliberation it was decided that the Celtic grenadiers should be sent specially to the Queen of Prussia, that she might make a present of them to her husband."

One fine evening in the early part of last summer, with the lights of eastern Long Island shining brightly, a large English steamer was

plumped on shore so hard and fast that her remains are still to be seen there, or were so very lately. There is nothing unusual in a ship going on shore in that locality in storm or fog, but to do so on such a night as that in question involves the certainty that those having the navigation in charge are unfit for their business.

Well, this particular steamer had a New York pilot on board, taken some hours before, but not yet on duty, as the vessel had not reached his pilot-ground. The pilot emerged from the cabin in the evening, saw the lights and the course the ship was steering, and just dropped a casual unofficial hint that they were rather close in with the land, and that if *he* were in charge the ship would be hauled off. But no notice was taken of the well-meant intimation, as the captain was below and the officer of the deck did not think worth while to disturb him. While the passengers were enjoying the fine evening and the sight of the lights on shore, the vessel herself was quietly and effectually "piled up," to use an expressive nautical term.

Well, of course, there was the usual investigation by the British consul and British ship-masters, one of whom it appears permitted himself to rebuke the pilot severely for not having prevented the "accident." The pilot kept his temper—(which many persons would not have done under the circumstances, for this swaggering skipper was altogether *ultra vires*)—the pilot kept his temper we say, and explained that he had given a strong hint, and that his experience of the amiable Briton did not lead him to proffer too much advice when he, the pilot, was not in charge. The court could do nothing to him of course, while the New York Board of Pilot Commissioners exonerated him completely.

Some time ago the *United Service Gazette* gave an account of a centenarian soldier, which appears to be so well authenticated that we are tempted to add it to the other similar cases which have been noted, from time to time, in these pages. The history is a very singular one. The old man in question is Lieutenant Nicolai Andrejevitch Sawin, now living at Saratoff, in Russia, who is stated to have been born in 1768, and who is consequently in his one hundred and twenty-seventh year. Strangely enough, this person with a Russian name and residence is a Frenchman, whose correct name is Savin, and who was born in Paris,—his father, André Savin, being then colonel of the Guards of Louis XV. Nicholas was sent to the Jesuit College at Tours, but, his father having been beheaded during the Terror, the youth enlisted under Bonaparte, in 1798, in the Second Hussars, made the Egyptian campaign, and returned to France in 1801. He subsequently served at Austerlitz and Jena, and was made chevalier of the Legion of Honor in 1809, after being severely wounded at Saragossa. He was

taken prisoner by the Spaniards, and confined in the former prison of the Inquisition, at Seville. By means of some of the old instruments of torture, which they used as tools, Savin and some fellow-prisoners made a mine, and escaped, only to undergo months of hunger and hardship while wandering in the Sierra. Eight of his companions succumbed to their privations, and only three others besides Savin succeeded in eventually rejoining the French army. He had several horses shot under him while serving under Ney at the defeat of Krasnoi, during the disastrous Russian campaign, and was at the passage of the Beresina. The French were by this time almost without arms, and half dead from cold and hunger. Savin's description of the events is as follows:

"Before crossing over, the marshal [Ney] ordered me to look after the wagons containing the treasures, which consisted of some four million francs in gold. The marshal ordered these wagons to cross by the bridge destined for the passage of the artillery and baggage, and in spite of my objections on the danger of such a proceding, he refused to cancel the order, and I was therefore forced to obey. My turn for passing was among the last, with the rear-guard under Marshal Victor. All the commanding officers and marshals were already on the other side, so that when it came there was no longer any semblance of order, no one obeyed orders. The artillery began to cross over at the same time as we did. Suddenly the Cossack lances were seen, and the tumultuous clamor became terrible.

"Scarcely had our wagons reached the middle of the bridge than the bridge, yielding to the weight of guns and ammunition wagons, broke down. In a moment men, guns, wagons, and caissons were struggling in a confused mass in the river. Having been thrown from my horse, I made superhuman efforts to avoid being crushed to pieces. The crowd prevented my advancing, and I was forced backward. A few moments afterwards we were surrounded by Cossacks, and should have been unable to defend ourselves for any time if it had not been for the intervention of a Russian general, who kept off the Cossacks and proposed that we should surrender. This general was Count Platoff, to whom many of us, including myself, are indebted for having escaped with our lives."

Lieutenant Savin was at first sent a prisoner to Jaroslav, and later on to Saratoff, where up to his hundredth year he gained a scanty subsistence by teaching French. At present he and his daughter, an octogenarian, are living in very straitened circumstances in a modest cottage in the suburbs of Saratoff.

A late number of Cassier's *Magazine*, in an article upon "war," reminds us that America has three times had the honor of revolution-

izing the art of war. "To American armies was due the introduction of the scout, or open system of fighting, with all the concomitants of skirmishers, rifle-pits, etc. Foreign nations were slow to adopt it, but it came at last, and is now universal. America, too, was the first to introduce the extensive use of the rifle and of sights on naval guns. To-day the rifle is the universal arm of the infantry, and a cannon without sights or means for accurate laying is as useless as one without powder. The third revolution was the introduction of the monitor, and here the honor belongs to the individual rather than to the nation. Despite all that may have been said to the contrary, Captain Ericsson's traditional 'cheese-box on a raft' was an entirely unique construction; the idea had never been previously carried into practice, and certainly had never been put into successful form. The work of the monitor produced a revolution in naval ideas, of which the full extent has thus far been only inadequately realized."

When the news of the premature end of one of the Arctic expeditions of the year was announced, the *Washington Post*—under the caption "Exploration for Revenue Only"—gave us an article upon the subject which is sure not to meet the approval of the explorer. Among other things the *Post* says of these expeditions,—

"The followers have very frequently escaped the trials of this disappointing world by leaving their bones upon some desolate and frozen shore; the backers have sometimes made money through the medium of a lecture tour, a few fossils, and a stereopticon; the dear people have held the bag and seemed, upon the whole, to like it. But these expeditions have never done anything real for science or humanity. They have invariably turned out to be tragedies or blunders. They have never brought back anything which, measured by the standard of utility, was worth a copper penny.

"This Wellman excursion, however, should not be classed with the seriously intended expeditions that preceded it. At no time has it risen above the level of broad burlesque. Its departure, its progress, its shipwreck scene, the rescue of the explorers, and their return to dry land,—all of this is as much like the voyage of Sinbad, personally conducted by the Kiralfy Brothers, as any one gaudy and transparent humbug could possibly be like another. Wellman has ventured into latitudes that are habitually visited by whalers in the way of business, his *papier-mâché* boat has gone to pieces, just as we see the thing done on the stage, the rescuing party has appeared at the proper time, and now Mr. Wellman returns to us bursting with conversation at the regular price, and ready for the lecturing tour that has been laid out for him in business-like anticipation of these events.

"To tell us under such circumstances that he is willing to talk is

about as startling as to announce that a duck will swim, that a pawnbroker will sell his forfeited pledges, or that a resident of Louse Alley will join you in a drink of whisky. That is what he arranged the expedition for, and he has taken excellent care that nothing should interfere with it.

"Some of our Arctic explorers have not been able to tell us what they saw, for the simple reason that they haven't come back yet. They were men of crude ideas and dull perceptions. The up-to-date explorer always gets back. His engagements compel him to."

In his "United States of Yesterday and To-morrow" William Barrows, D.D., makes some remarks which are so true that they will bear repeating. Speaking of the vast extent of our country, he says, "Suppose Texas to be a circular lake and France a circular island; the island could be anchored centrally in the lake out of sight of land, twenty-two miles from any point on the encircling shore. The vastness of this State of Texas—equal to the capacity of England five times, and of Massachusetts thirty-four—is not so very much overstated by the bold figure of Mr. Webster in his 7th of March speech,—'so vast that a bird cannot fly over it in a week.' One accurate statement in arithmetical figures is so startling as at first to provoke an honest disbelief. Nevertheless it is true that if the entire living population of the globe—fourteen hundred millions—were divided into families of five persons each, all those families could be located in Texas, each family having a house-lot of half an acre, and then leave more than seventy millions of family lots untaken. . . .

"Probably few Americans, even scholarly ones, and certainly very few of those whose benevolence works in the extension of education and Christianity for the world, realize how much the American Union was enlarged by the Mexican War and the treaty of Guadalupe Hidalgo that closed it in 1848, and the Gadsden Purchase. That treaty formally included and conceded Texas, previously annexed, and the total addition to the territory of the United States was equal to one hundred and four States as large as Massachusetts; it was one hundred and fifty times larger than the Holy Land of Israel, the Palestine of marvelous record. Patriotism, philanthropy, and Christianity have been singularly tardy in going in when our sword went out; and the most of this land has won but little interest, though under our own flag, compared with the interest given by us to lands under the Crescent, and to the territory and home missionary fields of the English Crown. It is one of the peculiarities of benevolence in the United States that so much of the foreign field of the American church is the home field of the British Crown and of the Established Church of England."

In other words, the author complains that India, China, Africa, and the Islands of the "Great South Sea" are the fields of effort for men who had better be devoting their energies and talents to the populations of our great West and Southwest, many of which are living without the means of either education or spiritual enlightenment while immense solicitude is manifested for far-away people who are living under foreign governments.

In a late number of the *Journal of the Military Service Institution* (that title which seems so long to write, and which covers so much that is worth reading) there is a paper upon "The Military Value of the Donkey," by Lieutenant L. D. Greene, of the Seventh United States Infantry.

In it the author asks, "May it not be, however, that the despised burro is worthy of better treatment and regard? Speaking for myself, I can say that observation in the mountains of Colorado of the capabilities of the humble subject of this argument leaves me to regard him as very much underrated. Wherever the daring prospector penetrates among the seemingly impassable rocks and cañons; when mines are opened far from beaten roads, and only accessible by paths and trails that try a man's full abilities to carry himself; up and down are seen tirelessly plodding the tuneful burros, packing sacks of ore down to the nearest wagon or railroad, and returning laden with all necessities of operating a mine,—provisions, tools, powder, candles, lumber, sheets of corrugated iron that roof him in from away in front of his nose to far behind his rump, heavy and crooked pieces of machinery, all are somehow fastened to him, and somehow he steers his way up rocky and slippery trails with a certainty of foot like a goat, and more sense than some men."

Absurdly cheap (Lieutenant Greene says that the price of a first-class pack-mule with *aparejo* will pay for about sixteen of these little beasts), docile, amiable, and intelligent, without the straying or bucking traits of some mules, the writer suggests their employment as suppliers of ammunition to the firing line, especially now that the consumption of ammunition is to be much greater under the use of the new arms. As he remarks, the burro is rarely stampeded, while horses and mules frequently yield to panic; and the burro will stagger along under a load of half his own weight, and climb over, through, or under timber or brush that would stop almost any horse or mule; "and if he gets stuck there, or in the mud, his small bulk and weight permit his release by two or three men; and, finally, if some hostile bullet finds in him its billet, the pecuniary loss to the service is very small, and is easily replaced. Aside from his value under fire is his every-day usefulness on campaign."

By a coincidence, on the very day that we read Lieutenant Greene's paper we were looking over a new book upon the "Camel, its Uses and Management," by Major Arthur Glyn Leonard, late of Her Majesty's Fifty-ninth Regiment, which deals with other animals used for military transportation also. After speaking of the elephant, camel, horse, mule, and pony, Major Leonard says, "In my estimation the donkey is the toughest customer of the lot; but his size, therefore small weight-carrying capacity, is against him, speaking comparatively, of course, for in proportion to his size he is up to great weight. Even the very smallest will carry an average of one hundred and thirty pounds. He is, if anything, more enduring and will thrive on less food than the mule, and he is not shod. . . . To supply the fighting lines, and even the supports and reserves, with ammunition he would be invaluable. He can carry two boxes, can be kept out of sight, and can keep up easily; besides, the ammunition would be much easier to get at. He cannot walk as fast as either a pony or a mule; his average pace being two and a half miles an hour; but he requires far less care and attention, fewer drivers (one to six or eight), and infinitely less rations to carry, and he is little or no trouble to look after, for he has great patience and docility."

Major Leonard, whom we have just been quoting, is an old campaigner in India, Afghanistan, Egypt, and the Soudan,—and appears to have been often in charge of very large numbers of camels employed in military transportation. His book is quite an exhaustive one in certain lines,—and especially useful as a guide to the soldier who has to use these animals.

It was, therefore, with especial interest that we looked for his opinion in regard to wild camels,—a subject which has been frequently referred to in these notes during the past two years. He says, "The camel is one of the oldest mammals now living, is essentially a domesticated animal, and one of the earliest ever domesticated. It has never, at least to my knowledge,—but I am open to correction,—been found in a wild state, nor have any traces ever been discovered of its having been so at any period of the world's history. Prejevalsky says that wild camels frequent the wastes of Lake Lob-Nor, in Central Asia, and I have read elsewhere that herds of wild ones, of the bactrian species, have been reported to exist in Turkestan, as also in the desert tracts of Shamo on the Chinese frontier; but I have never seen these statements verified or confirmed. In Nubia and Soudan large herds are allowed to run wild by their owners, and this is what also occurs in Central Asia, I should imagine, there being a vast difference between wild camels and camels that are allowed to run wild. Up to the present naturalists have failed in their endeavors to unearth any reliable evidence of the existence in the prehistoric ages of its wild ancestor; though, on the other hand, they have been able to indicate with toler-

able accuracy and certainty the progenitors of all other domestic quadrupeds."

Major Leonard adds that the fossil remains of the camel, in the tertiary strata of India, are of a slightly larger animal, but otherwise hardly distinguishable from recent specimens. He quotes Murray as making the same observation, which also hold good in the quaternary deposits of Algeria; while he mentions our American naturalists —Cope and Marsh—as deriving the same results from investigations of the miocene and eocene strata.

One of the remarkable works of this century, as the *Nautical Magazine* truly remarks, is the harbor at Nieuwe-Diep and the Helder Canal. Before this canal (rendered necessary by the increase in size of sea-going vessels employed in the trade of Amsterdam) could be begun, the Helder dike had first to be formed, in order to protect the works from the fury of the gales which swept the North Sea. This dike is six miles in length, and forty feet broad on the summit, and presents to the sea an inclined face of two hundred feet at an angle of forty degrees, the whole being constructed of massive granite blocks from Norway. But all the ship-canal works and drainage work, already done in Holland by her very capable hydraulic engineers, will be small in comparison with that gigantic undertaking,—the draining of the Zuider Zee,—about to be begun, after a consideration of many years. Four hundred and fifty thousand acres—or enough land to make two thousand five hundred extensive farms—it is proposed to reclaim, at an estimated cost, if we take in measures of defense and compensation to fishermen and others, of about one hundred and twenty-five million dollars. "This is clearly a large speculative expenditure for a not very rich country like Holland, but there are few people who will not be ready to agree that the money, if so spent, will be put to a much better purpose than sinking the same amount on an army or on an iron-clad navy, in the case of Holland. The value of the land to be reclaimed is computed at twenty-six million one hundred thousand pounds, and thus in thirty-two years—for that is actually the time allowed for completing the work—Holland will not only have added a fertile province to her territory, but will be in a position to make a profit of not less than a million sterling out of the transaction."

"Though old in one sense the Zuider is still the youngest sea in Europe, for previous to the year A.D. 1219 the whole sea extending from the Texel, Vlieland, and Schelling south to Narden, was either dry land, forest, or marsh, with the exception of Lake Flevo, which was drained by the river Yssel, not then, as now, an arm of the Rhine. About B.C. 12, the Roman general Claudius Drusus cut a canal from the Rhine to the Yssel, and chiefly owing to this, as some assert, the

lake overflowed its banks, and commenced to submerge the low-lying adjacent lands. In A.D. 1219, after a continued stress of northwest gales, the furious topping waves of the North Sea broke down the dikes, reaching from the Texel to Schelling, when a great portion of the country, lying from twelve to fifteen feet below the level of the ocean, was inundated. These ravages continued more or less every winter, and so went on swallowing up the lowland till the year 1282, when the last great inundation took place, and gave to the Zuider Zee the form and depth which it still preserves. About the same period inundations occurred on the low sandy shores of the Scheldt and the Meuse, by which Holland lost to the devouring sea some three hundred square miles of valuable land."

The opening of the great strategic and commercial ship-canal from the Baltic to the North Sea is already being arranged for, as it is expected to be quite ready by the 1st of May, 1895. Of course, the emperor will be present, and in his usual form, unless something unexpectedly takes place. The canal will be lighted throughout its entire length by means of incandescent lights of twenty-five candle-power, ranged on each bank about two hundred and fifty metres apart. Altogether there will be nine hundred and fifty-two of these lights, which will enable vessels to pass by night as easily as by day. At the entrances of the ports and turn-outs the lights will be colored. In the lakes which the canal traverses the channel will be marked by buoys lighted by gas.

E. SHIPPEN.

NAVAL AND MILITARY NOTES.

NOTES AND DATA ON NAVAL AND MILITARY MATÉRIEL AND ALLIED SUBJECTS.

It is the intention to collect and publish in this department of the "United Service" all information obtainable from current publications and other available sources concerning ships, guns, armor, explosives, small-arms, military and maritime affairs, and kindred subjects. As the data are derived largely from unofficial sources, strict accuracy cannot be expected; but all reports will be carefully examined and compared with others on the same subject, and it is hoped, by this means, to attain fairly correct results. Erratum notices will be published whenever errors are discovered in data previously given. As the development of the present plans for collecting information progresses, it is hoped to secure fuller and more authentic reports.

ABBREVIATIONS USED IN THE NOTES.

b.l. = *breech-loading guns of ordinary (not rapid-fire) type.*
cm. = *centimetre.*
f.a.m.l. = *fore and aft midship line.*
I.H.P. = *indicated horse-power.*
l.w.l. = *load water-line.*
m.g. = *machine gun.*
mm. = *millimetre.*
pr. = *pounder (as 6-pr.).*
r.c. = *revolving cannon.*
r.f. = *rapid-fire.*
r.f.g. = *rapid-fire gun.*

WAR-SHIPS AND TORPEDO-BOATS.

Great Britain.

NEW BATTLE-SHIPS: NAMES, ENGINES, ETC.—The names assigned to the new first-class battle-ships are as follows:

No.	Name.	Where Building.
1.	Prince George	Portsmouth.
2.	Victorious	Chatham.
3.	Hannibal	Pembroke.
4.	Illustrious	Chatham.
5.	Cæsar	Portsmouth.

CONTRACT SHIPS.

No.	Name.	Where Building.
6.	Mars	Laird, Birkenhead.
7.	Jupiter	Thomson, Clydebank.

The engines for the *Prince George* are ordered from Humphreys, Tennant & Co.; for the *Victorious*, from Hawthorn, Leslie & Co.; and for the *Hannibal*, from Harland & Woolf. They are to be of 10,000 I. H. P. with natural draft, and of 12,000 I. H. P. with forced draft. The speed is expected to be about 18 knots maximum.

"VENUS," "DIANA," "DIDO," "IRIS," "JUNO," "DORIS": CONTRACTS AWARDED.—The contracts for the construction of the six second-class cruisers have been given out as follows: The *Venus* and the *Diana* to the Fairfield Ship-building and Engine Company; the *Dido* and the *Iris* to the London and Glasgow Ship-building Company; and the *Juno* and the *Doris* to the Naval Construction and Armaments Company.

"TALBOT," "MINERVA," "ECLIPSE": WATER-TIGHT DOORS.—The dock-yard officials have been instructed that in vessels of the *Talbot* class, no water-tight exit-doors are to be fitted in machinery casings or protective docks, but access to the several casings may be provided, where required, by the fitting of coaling scuttles (!) in the main deck. This arrangement has been decided upon with a view to reduce, as far as possible, the

number of apertures hitherto provided in the water-tight casings and decks of modern cruisers.—*Army and Navy Gazette.* [The above is not very intelligible. The idea seems to be to make the entrances to compartments from above, as far as possible, and so avoid doors in the bulkheads below. Whether the "coaling scuttles" and necessary hatches are to be utilized, as far as possible, to avoid cutting too many holes in the protective deck—or hatches *similar* to coaling scuttles are to be fitted—can only be guessed at.]

"HALCYON": LAUNCH.—The torpedo-gunboat *Halcyon*, 1070 tons, was launched at Davenport dock-yard on April 6.

"HAZARD": STEAM TRIALS.—The steam trials of the torpedo-gunboat *Hazard*, 1070 tons (and a sister ship to the *Halcyon*, mentioned above), took place on March 30 and April 3. On the 8-hour natural-draft trial the results were: Steam-pressure, 137 pounds; air-pressure in fire-rooms, 0.82 inch; vacuum, 24.8 inches; revolutions, 228.4; I. H. P., 2604; speed, 17.1 knots. The 3-hour forced-draft trial gave: Steam, 142; air-pressure, 2.19; I. H. P., 3714; speed, 19 knots.

TORPEDO-BOAT DESTROYERS: NAMES WHERE BUILDING, ETC.—The following is a complete list of the 42 torpedo-boat destroyers built or building at the yards of the various constructors named. The letters (D), (M), and (P), following the names of the boats, indicate the fleet reserve to which they will be assigned when complete, (D) signifying Devonport, (M) Medway, and (P) Portsmouth. Twelve are thus assigned to the first, fourteen to the second, and sixteen to the third.

Laird, Birkenhead: *Banshee* (D), *Contest* (D), *Ferret* (D), *Lynx* (D), *Dragon* (P).

Hanna, Donald & Wilson, Paisley: *Fervent* (D), *Zephyr* (D).

Thomson, Clydebank: *Rocket* (D), *Shark* (D), *Surly* (D).

Naval Armaments Company, Barrow: *Skate* (D), *Starfish* (D), *Sturgeon* (D).

Armstrong, Elswick: *Spitfire* (M), *Swordfish* (M).

Thorneycroft, Chiswick: *Ardent* (M), *Boxer* (M), *Bruiser* (P), *Daring* (M), *Decoy* (M).

Yarrow, Poplar: *Charger* (P), *Dasher* (M), *Hasty* (M), *Havock* (P), *Hornet* (M).

White, Cowes: *Conflict* (P), *Teazer* (P), *Wizard* (P).

Fairfield Ship-building Company: *Handy* (P), *Hart* (P), *Hunter* (P).

Doxford & Son, Sunderland: *Hardy* (P), *Haughty* (P).

Palmer, Jarrow-on-Tyne: *Janus* (P), *Lightning* (P), *Porcupine* (P).

Thames Iron Works: *Zebra* (P).

Earle Ship-building Company, Hull: *Salmon* (M), *Snapper* (M).

Hawthorne, Leslie & Company, Newcastle: *Sun-fish* (M), *Ranger* (M), *Opossum* (M).

"SPEEDY," "HAVOCK": TEST OF BEHAVIOR AT SEA.—In order to test their seaworthiness and speed in rough weather, the torpedo-gunboat *Speedy* and the torpedo-boat destroyer *Havock* were recently sent out when it was blowing a gale. A speed of 17 knots was maintained.

"JASON": COMMISSION TRIAL.—The torpedo-gunboat *Jason*, 810 tons, was recently commissioned for service. On her commission trial the results were: steam, 139 pounds; air-pressure, 1.5 inches; I. H. P., 2605; revolutions, 215; speed, 15.8 knots. These results were regarded as "highly satisfactory." It is interesting to compare them with those obtained on trial. (See NOTES in UNITED SERVICE for May, 1893.) The 8-hour natural-draft trial gave: Steam, 136 pounds; air-pressure, 0.83 inch; I. H. P., 2676; revolutions, 222; speed, 19 knots (by a very active patent log, probably). On the forced-draft trial the results were: Steam, 147 pounds; air-pressure, 2.0 inches; I. H. P., 3540; revolutions, 243.5; speed, 20.8 knots (also by an ambitious patent log). Comment is hardly necessary. No matter what are the causes of the low speed, a torpedo gunboat which can only make 15.8 knots, with a clean bottom and machinery in perfect order, can hardly be called a glittering success.

"SULTAN," "WARRIOR," "IMPÉRIEUSE," "ALEXANDRA," "ACHILLES," "NEPTUNE," "GLATTON," "IRIS," "INFLEXIBLE," "INDEFATIGABLE," "INTREPID," "EXCELLENT": NEW RAPID-FIRE GUNS, ETC.—Three-pounder rapid-fire guns are to be substituted in the following ships at Portsmouth, for their existing complements of Nordenfeldts, in the numbers stated: *Sultan*, thirteen on recoil mountings; *Warrior*, six; *Impérieuse*, five; *Alexandra*, six on recoil mountings; *Achilles*, ten; *Neptune*, four; *Glatton*, two; *Iris*, two on recoil mountings; and *Inflexible*, seven on recoil mountings. The drill-ships are to be fitted with 6-inch guns on A. B. mountings, the *Indefatigable* and *Intrepid* with 6-inch rapid-fire guns in place of the same calibre breech-loaders, and the *Excellent* with 4-inch quick-firers and 6-pounder quick-firers on recoil mountings. Many of the ships are also to be fitted with dry-dock flooding gear.—*London Times.*

CORDITE: SERVICE TEST.—Some of the new cordite charges supplied to the Channel Squadron are to be stowed in the hottest magazines in the ship, in order to test the keeping qualities under such unfavorable conditions. The trial is to last six months, at the end of which time new cordite will be supplied and tested alongside that stowed in the magazine mentioned.

WATER-TIGHT DOORS: PRECAUTIONS TO BE OBSERVED.—The Admiralty have recently issued instructions on the working of water-tight doors, pointing out in detail the precautions which are to be observed in this connection. When ships are underway or in the vicinity of other ships underway, or when there is a probability of grounding or collision, and when ships are preparing for action or evolutions under steam, all coal-bunkers, store-rooms, and water-tight compartments not actually in use are to be kept closed. The collision bulkhead is always to be kept intact, and all empty water-tight compartments are to be kept closed. In the case of those compartments opened for the supply of coals or stores, or for the purposes of ventilation, they are again to be closed as soon as possible, and reported so. When manœuvring, and when entering or leaving a port or anchorage, all the water-tight doors, sluice valves, and scuttles, which can be closed without convenience to the working or ventilation of the ship, are to be closed. In the case of doors necessarily left open, men are to be stationed so as to close them, when expedient, at a moment's notice. At night and in fogs similar precautions are to be observed, all compartments being closed which are not in use for work or sleeping purposes. The stations for collision are in future to include men for closing gun-ports and armored doors, and, if needed, special ladders are to be rigged to facilitate traffic.—*Marine Engineer.*

AUXILIARY CRUISERS: ARMAMENTS FOR.—According to the present instructions of the Admiralty, armaments for transforming merchant steamers into auxiliary cruisers are to be kept stored (and ready for immediate installation) as follows: at Devonport, 8; at Woolwich, 8; at Portsmouth, 4; at Hong-Kong, 4; at Sydney, 2; in all, 26 sets. Of these, thirteen will consist of eight 4.7-inch R. F. G. and eight 4-barrel, 1-inch Nordenfeldt machine guns. The other thirteen will consist of eight 5-inch R. F. G. and eight Nordenfeldts. Each of the merchant vessels which are subsidized or are, by special arrangement, to be held at the disposal of the government in case of war, will in that event be sent to the port assigned it, and take on board its battery. Steamers on the Australia and China routes will take on their armaments in England, or at the other end of the line, as is most convenient.

France.

"COETLOGON": UNSUCCESSFUL TRIALS.—The cruiser *Coetlogon* has as yet failed to achieve a successful trial. On her last trials, in March, the average speed attained was 18 knots with 115 revolutions; for a short time she made 121 revolutions and over 19 knots. But the defects in the boilers, previously noticed, were again apparent, and she was compelled to return to port to repair them. The temperature of the fire-room

was said to have been insupportable, varying from 60° C. (140° F.) and 70° C. (158° F.). The engine-room was also very hot, and the engineers on watch had to be replaced every two hours.

"SUCHET": TRIALS.—The protected cruiser *Suchet*, 3027 tons, has undergone her steam trial successfully. The 2-hour forced-draft trial, on March 20, gave 8842 I. H. P., and 20.417 knots. The 6-hour natural-draft trial, on April 9, gave 6210 I. H. P., with 18.238 knots. The 24-hour natural-draft trial took place on April 16 and 17. The results were: I. H. P., 4119; speed, 16.73 knots; revolutions, 105. The machinery worked smoothly and satisfactorily.

"AVERNE": TRIAL.—The sea-going torpedo-boat *Averne*, attained a mean speed of 24.4 knots on her steam trial. A speed of at least 25 knots was expected, though only 24 knots was required by contract. The dimensions of the *Averne* are: Length, 137 feet 9 inches; beam, 16 feet 5 inches; draught, 9 feet 4 inches; displacement, 115 tons. The anticipated I. H. P. of the engines was 2100. The coal-supply is 16 tons, and the complement 35. Two 3-pounder rapid-fire guns are carried in addition to her torpedo-tubes.

TORPEDO-BOAT NO. 51: SINKING OF.—Torpedo-boat No. 51 sank in the Charente. The causes of the accident have not been published.

TORPEDO-BOATS IN RESERVE: CONDITION OF.—The *Marine de France* publishes an account of the interrogatory to which Commandant Vidal, director of the Submarine Defenses at Toulon, was subjected by the delegates sent to that port by the special commission appointed to inquire into the condition of the French navy. From this interrogatory it appears that, out of forty torpedo-boats in the reserve, only twenty-five are ready for service. Many of those incapacitated have been damaged by the red lead used on their hulls, which has eaten holes into them. The iron plates which have been affected this way came from Creusot. The statements of Commandant Vidal also brought into evidence numerous defects in the organization and storage of the torpedo-boats.—*New York Herald, Paris edition.*

"MAGENTA": BEHAVIOR AT SEA.—Post-Captain Valery, the commander of the *Magenta*, the war-ship, which in the opinion of the commission is of a decidedly inferior construction as a fighting vessel, has forwarded to that body a number of documents relating to his vessel which have been asked for by the president (of the commission). With these documents Captain Valery has sent a letter in which he denies the conclusions come to by the commission in regard to his ship. He states that two weeks ago, when in the vicinity of Corsica, the *Magenta* was caught in a severe gale, and that she rode it out in a most admirable manner. In spite of the severe gale, he maintains that the battery of 34-centimetre guns were as much in a position to fire as if the vessel had been in Toulon harbor. The lower-deck batteries were certainly put out of action by the motion of the ship, but the captain maintains that there is no man-of-war afloat which could make use of her lower batteries in such a sea.

Italy.

VESSELS BUILDING.—The Italian budget devotes 23,360,000 lires ($4,578,560) to new constructions for the navy, distributed as follows: Completion of the *Sicilia*, at Venice; construction of the second-class battle-ship *Ammiraglio di Saint Bon*, at Venice; construction of the second-class battle-ship *Emanuele Filiberto* (sister to the *Saint Bon*), at Castellamare; construction of two other second-class battle-ships not yet commenced; completion afloat of the lightly-armored cruiser *Marco Polo*, at Naples; completion of the protected cruiser *Calabria*, at Spezia; construction of a protected cruiser not yet commenced; construction of the armored cruisers *Carlo Alberto*, at Spezia, *Vettor Pisani*, at Castellamare, *Giuseppe Garibaldi*, at Sestri Ponente, *Varese*, at Livorno (Leghorn), and a fifth not yet named; construction of two torpedo-gunboats of the *Rartenope* type; completion of the dispatch-

boat *Governolo*, at Venice, and of the torpedo-gunboat *Caprera*, at Livorno; and the construction of two torpedo-boat destroyers, several torpedo-boats, and of various small craft.

NEW SECOND-CLASS BATTLE-SHIP.—According to the *Italia Militar e Marina*, a new armor-clad, of the type of the *Ammiraglio di Saint Bon*, with special modifications of armament from designs by Signor Pullino, and which have been approved, is to be laid down at Spezia. This is one of the two new second-class armor-clads referred to above.

Spain.

VESSELS BUILDING.—According to the latest information the following vessels are under construction for the Spanish navy:

ARMORED CRUISERS.

Carlos V., 9235 tons, in a private yard at Cadiz; *Princesa de Asturias*, 7000 tons, at Cadiz Arsenal, to be launched 1894; *Cataluña*, 7000 tons, at Cartagena Arsenal, to be launched 1894; *Cardinal Cisneros*, 7000 tons, at Ferrol, to be completed 1894; *Maria Teresa*, 7000 tons, in the Nervion Yard, Bilbao, to be completed 1894; *Almirante Oquendo*, 7000 tons, in the Nervion Yard, Bilbao, to be completed 1894; *Viscaya*, 7000 tons, in the Nervion Yard, Bilbao, to be completed 1894.

PROTECTED CRUISERS.

Alfonso XIII., 4826 tons, at Ferrol Arsenal, nearly finished; *Lepanto XIII.*, 4826 tons, at Cartagena Arsenal, to be finished 1894.

TORPEDO-GUNBOATS.

Audaz, 570 tons, at Cadiz Arsenal, nearly finished; *Marques de Molins*, 570 tons, in a private yard at Ferrol, nearly finished; *Galicia*, 570 tons, in a private yard at Ferrol, nearly finished; *Rapido*, 570 tons, in a private yard at Ferrol, nearly finished.

TO BE BUILT.

One armored cruiser of 9235 tons, a sister ship to the *Carlos V.*, and three torpedo-gunboats of 570 tons, are to be built,—the latter at Ferrol,—but they have not yet been commenced.

Japan.

"TATSUTA": LAUNCH, DESCRIPTION.—The twin-screw torpedo-gunboat *Tatsuta* was launched at the works of Armstrong, Mitchell & Company, Elswick, April 6. Her dimensions are: Length, 240 feet; beam, 27 feet 6 inches; displacement, 875 tons. The designed I. H. P. of the engines is 5500, and the corresponding anticipated speed is 21 knots. The coal-supply is 200 tons. The battery consists of two 4.7-inch R. F. G., four 3-pounder R. F. G., and five torpedo-tubes. The latter are said to be particularly well fitted and to be superior to any on existing ships.

Brazil.

END OF THE NAVAL REVOLT.—The Brazilian revolution, so far as the navy was concerned, practically came to an end with the torpedoing and capture of the *Aquidaban*, near Desterro. The remainder of the revolutionary fleet, consisting of the *Republica* and three or four armed merchant steamers, was surrendered to the Argentine authorities at Buenos Ayres, and were by them turned over to the Brazilian admiral in command of the government naval force at Montevideo. A description of the attack on the *Aquidaban*, derived from participants in the fight and other reliable sources, will be given in next month's NOTES.

ARMOR.

United States.

On July 12 and 13 a test-plate of Group 15, *Oregon's* 17-inch curved Harveyized nickel-steel armor, was tested at Indian Head. Dimensions: Length, 13 feet 1 inch; width, 8 feet 8 inches; thickness, 17 inches; weight, about 34 tons. The plate was secured in the usual manner to oak backing, 36 inches thick at top and bottom, and increased to 42 inches in the middle to conform to curvature of plate. This plate had a soft strip 6 inches wide on its left edge, a soft strip 8 inches wide whose centre was 48 inches from left edge, and a third soft strip 14¾ inches wide on right edge. Centre of plate normal to line of fire. Distance muzzle of gun to plate 387 feet. Gun used, 12-inch breech-loading rifle.

Round 1.—Charge, 253 pounds; striking velocity, 1410 f. s.; striking energy, 11,728 foot-tons, or 345 foot-tons per ton of plate. Carpenter A. P. shell of normal weight and dimensions, hardened 2¾ inches below bourrelet, struck plate 56 inches from right edge, 51 inches from bottom plate, practically normally, penetrated about 15 inches, and rebounded about 70 feet to the front. The point and surface of ogival as far as the shoulder were fused off and remained welded in impact. Projectile uncracked, but shortened about 1.5 inches. A peculiar front bulge, 1.3 inches high and 24 inches long, was raised about the impact. In this bulge there were about forty radial or bulge-cracks 3 to 6 inches long. There were no cracks in plate.

Round 2.—Charge, 396 pounds; striking velocity, 1858 f. s.; striking energy, 20,364 foot-tons, or 600 foot-tons per ton of plate. A Wheeler-Sterling projectile, hardened 2 inches below the bourrelet, was used, and struck the plate normally 64 inches from left edge, 37 inches from impact No. 1, 53 inches from bottom, and about 14 inches to the right of the vertical soft strip. It penetrated the plate and the backing and was recovered. The projectile was in somewhat similar condition to projectile used in first round, more of the point being broken off, but shell not much swelled. The body was increased in diameter 25 inches.

Round 3.—Fired July 13. Same charge, striking velocity, and energy as in second round. Carpenter A. P. projectile, of normal weight and dimensions, hardened 2¾ inches below bourrelet, struck the plate in the upper right-hand corner, 29 inches from top, 33 inches from right edge, and about 18 inches to the left of right-hand vertical soft strip, 24 inches above normal line, at an angle of about 7½ degrees with the normal at point of impact. Projectile remained in plate, base at about 10 inches from face of plate, giving an estimated penetration of 20 inches. The shell was much swelled and cracked, measuring about 13.6 inches in diameter at edges of impact. Bulge about 34 inches in diameter, and from 1 inch to 1.4 inches high (higher on upper side of impact), with radial cracks similar to those of former impact. The plate was cracked through from impact to top, the crack measuring 1 inch wide on face at upper edge of plate and ⅛ inch at the back. Another crack opened from this impact to impact No. 1.

Round 4.—Fired July 23. The plate was replaced directly in front of *Indiana's* plate and supported against it by oak blocking, the *Indiana's* plate itself being supported in a similar manner to the backing. New distance of gun from plate, 380 feet; charge, 376 pounds, giving same striking velocity, energy, etc., as in last two rounds. Carpenter A. P. projectile, of normal weight and dimensions, hardened 4½ inches below bourrelet, struck plate normally 29½ inches from right edge, 30 inches from bottom of plate, and 28 inches from impact No. 1. The shell broke up, ogival, bourrelet, and upper part of body remaining in impact, welded in plate, but cracked, distorted, and very much swelled, the car of projectile being 8.7 inches in from face of plate. Estimated penetration about 18 inches. In penetrating the shell turned a little to the right. Two through cracks opened out from this impact,—one from ½ inch to ⅝ inch wide to bottom of plate, the other ⅜ inch to ½ inch wide, running to left and upward, tangent to impact 1, and joining crack from impact 3 to impact 1. The bulge cracks already existing about impact 1 opened out still farther, one extending 26 inches from impact and the other 15 inches. The cracks made by impact 3 opened out to 2 inches at top of plate. The plate after this test, with the group it represented, was accepted.

A second test of the *Indiana's* side armor was made, July 20, by the trial of another plate from the group manufactured by Bethlehem Iron Company. The plate selected was 16 feet ¼ inch long and 7 feet 6 inches wide on the face. The plate was 18 inches thick at the top and tapered down to the lower edge. It was secured in the usual manner to a solid oak backing, and was 387 feet from the muzzle of the 12-inch breech-loading rifle which attacked it.

Round 1.—Charge, 249¾ pounds; striking velocity, 1465 f. s.; striking energy, 12,660 foot-tons, or 370 foot-tons per ton

of plate. A Carpenter A. P. projectile, weighing 850 pounds, was used, and struck the plate normally, 54 inches from right edge and 55 inches from bottom, and broke up, point and ogival welding into impact, and other pieces flying to considerable distances. A bulge 34 inches in diameter and from $\frac{3}{8}$ inch to $\frac{5}{8}$ inch high was raised about impact. No cracks in plate.

Round 2.—Charge, 397½ pounds; striking velocity, 1926 f. s.; striking energy, 21,822 foot-tons, or 640 foot-tons per ton of plate. A Carpenter A. P. shell was used, striking the plate normally, 103 inches from right edge, and 49 inches from impact No. 1. The shell broke up, forward part of shell as far as bourrelet remaining in impact. The plate was divided into two pieces by an irregular crack from top to bottom through impact, the two pieces being wedged apart by the force of the blow. The crack opened out in plate was $\frac{3}{4}$ inch wide at bottom and $\frac{1}{2}$ inch at top, the plate being slightly dished about impact. As this plate came up to the specifications the group which it represented was accepted.

The London *Engineer* of January 19 gives a brief description of the Texel (Holland) armor trials which took place on August 23 and 24, 1893. The plates were 2 metres (6 feet 7 inches) wide, 1.5 metres (4 feet 11 inches) high, and 15 centimetres (5.9 inches) thick. They were attacked by a 12-centimetre (4.7-inch) gun of 35 calibres, firing steel, armor-piercing projectiles, weighing 26 kilogrammes (57.3 pounds), with charges varying from 6.7 kilogrammes (14.8 pounds) to 10.6 kilogrammes (23.4 pounds). The competing plates were from the following manufacturers, each furnishing one: Vickers, Cammell, Brown, Krupp, Schneider, St. Chamond. Vickers, Cammell, and Brown submitted nickel-steel plates, Harveyized; Krupp and Schneider, plates of nickel-steel, face-hardened by processes of their own; the composition of the St. Chamond plate is not given, but it was not face-hardened. The results of the trial are briefly shown in the accompanying table. Five shots were fired at each of the plates, but, at the request of the makers, two additional shots were fired at the Vickers plate. The pointing was very defective and the points of impact by no means evenly spaced, which renders exact comparison a little difficult. In the case of each plate the shots were directed as follows: The first four shots at corners of a square 0.5 metre (7 feet 7.7 inches) on a side; the first shot at the right upper corner, the second at the left lower corner, the third at the left upper corner, and the fourth at the right lower corner; the fifth shot was directed at the centre of the square.

The Vickers plate developed an irregular Y-shaped through crack from the lower edge of the plate through shot-hole No. 2 to shot-hole No. 3, thence branching, one part extending nearly vertically to the upper edge, the other through impact No. 1, and thence, inclining a little to the right of the vertical, also to the upper edge. The plate was thus broken into three pieces, but the bolting held them,—not only firmly against the backing, but closely down into place against each other. Shots No. 4 and No. 5 developed no cracks, nor did No. 6. The last shot, striking near the left edge of the plate, caused a crack to form from the shot-hole to the edge, but it did not extend through the plate. The centre of impact of No. 6 was about ten inches to the right of No. 4, and of No. 7 was about fifteen inches to the left of No. 3. The hits were fairly well spaced,—so far apart that the resistance of the plate to any shot at its point of impact was not unduly weakened by too close proximity of previous shot-holes.

The Cammell Harveyized plate was apparently much softer than the Vickers plate, and the surface carbonization not so deep. The plate was not cracked, but the last three shots perforated it completely, and the fifth passed so far beyond that it was not even recovered. Shots Nos. 1, 2, 3, and 4 were well placed, but No. 5 struck so close to No. 4 that less than three inches supervened between the holes and thus met less resistance to perforation.

The Brown plate apparently showed defective treatment. The portion around shot-holes 3 and 5 seems to have been

softer than elsewhere. Projectiles 2 and 4 broke up, but the amount of penetration attained by No. 2 seems to indicate that the projectile may have been inferior. No. 5 perforated plate and backing, and, ranging a considerable distance beyond, was lost. The plate was not cracked.

The Schneider plate showed the same irregularities. The spacing of the fifth shot was bad, as it struck so close to No. 2 that the shot-holes overlapped slightly. Yet No. 5 penetrated only about as far as No. 2, and neither got through the plate, both breaking up. Nos. 3 and 4 went through both plate and backing. The plate was not cracked.

The appearance of the front of the Krupp plate gives no indication of surface-hardening. Around each shot-hole was raised the fringe so characteristic of tough and ductile steel armor which has not received hardening treatment. And the general behavior of the plate supported this view of the case. The three last shots at the higher velocities penetrated both plate and backing; and No. 5, which was not recovered, passed beyond to a distance estimated at 2000 metres. This was, in fact, a very poor plate. The heads of two projectiles were broken off (Nos. 2 and 3), but as they were fired at comparatively low velocities, the fact is rather against the projectiles than in favor of the plate.

The St. Chamond plate of plain steel without surface hardening was perhaps the best plate of its kind ever tried. Shots Nos. 4 and 5 perforated the plate, but with so little remaining energy that they remained in the backing, though No. 5 poked its nose through the skin-plating in rear. The spacing of the shots was bad, shot-holes Nos. 4 and 5 being within an inch of each other, though this does not seem to have materially affected the result. The plate was uncracked, and, taking this into consideration with its excellent resisting powers, it was declared by the Dutch officers to be the best plate of the lot. A little greater velocity would certainly have caused three projectiles to completely perforate both backing and armor, while in the case of the Vickers plate there is nothing to show that any attainable velocity would have caused projectiles of the calibre and quality used to have been driven through. Though through-cracked, every piece of the plate remained upon the backing and offered almost as great resistance as before. The Vickers plate, moreover, was not the best of that very excellent make, and far from equal to the 6-inch Harveyized plate tried on board the *Nettle*, January 19, 1893, which broke up a *6-inch* Holtzer projectile fired at a velocity of 1815 foot-seconds, with insignificant penetration; while at 1960 feet velocity, though the perforation was complete, the projectile did not get through the backing, in which it was found, broken into small pieces.

TABLE OF RESULTS, TEXEL ARMOR TRIAL.

Round.	Striking Velocity.	Penetration in Inches, and Remarks.					
		Vickers.	Cammell.	St. Chamond.	Krupp.	Schneider.	Brown.
1	{ 440 m. s. 1444 f. s.	6.9	6.9	6.4	6.9	7.2	6.9
2	{ 480 m. s. 1575 f. s.	8.1	11.6	7.4	8.0	Nearly through.	Nearly through.
3	{ 500 m. s. 1640 f. s.	2.41 Shot broken	Through.	Nearly through.	Through.	Through.	Through.
4	{ 540 m. s. 1772 f. s.	Shot broken up.	Through.	Through.	Through.	Through.	6.3 Shot broken up.
5	{ 573 m. s. 1880 f. s.	Shot broken up.	Through.	Through.	Through.	Nearly through.	Through.
6	{ 440 m. s. 1444 f. s.	6.5 Shot broken	.....	.....	.....	.....	.....
7	{ 440 m. s. 1444 f. s.	7.1	.....	.....	.....	.....	.....

POLA (AUSTRIA) ARMOR TRIAL.—A partial account of this trial, taken from telegraphic reports, was given in the NOTES three months ago. The following, which is more complete, is from the London *Engineer:* "We have been permitted to read the official report of a competitive trial of armor plates which took place in October and November last. The plates competing were four nickel-steel plates supplied by Dillingen (of Hanover), Vickers, Cammell, and Witkowitz (in Bohemia), as well as a Harveyized plate sent by Vickers, and a plate with a hardened face sent by Krupp, termed in the report a Harveyized plate, but this is probably a slip, as Krupp specially explains that it is not the Harvey process which he employs. The plates were 5.9 feet by 7.87 feet by 10.6 inches. They were attacked by four rounds towards the corners from a 15-centimetre (5.9-inch) gun, firing a steel projectile weighing 112.4 pounds, with a striking velocity of about 1980 feet, except one round at the Dillingen plate with 2070 feet velocity, which was thought to be too severe for the gun, and, it might be said, for the plate also, seeing that it passed completely through. A fifth round was fired at the centre with a steel shot from a 24-centimetre (9.4-inch) gun, the steel projectile weighing 474 pounds, with a striking velocity of 1417 foot-seconds. The 15-centimetre projectiles were just a match for the plates, theoretically, the calculated perforation, on the English system, being 13.4 inches of iron or 10.8 inches of steel. The larger shot was an overmatch, having, theoretically, a perforation of 15.4 inches of iron or 12.3 of steel. The general result was that the Vickers Harveyized plate and the Witkowitz plate only were considered to have fulfilled the required condition of keeping out the smaller shot. The former was fractured by the larger shot, and the latter was not, nor did it let it perforate; so that while it may be wondered how this plate should beat those of the best makers known, it can be no wonder that the Austrians preferred their own plate. The Krupp plate had some flaw which caused it to break up in such a way as not to be a fair representative plate. It was the same kind of disappointment as occurred at Ochta a year ago. It may be observed that the successful plate again (referring to the Texel trial) was an untreated one. The report concludes in the following words: "The firing test is, however, significant in so far as it proves that a homogeneous nickel-steel plate of corresponding treatment is superior to the Harveyized plates, and this does away with the difficulties which would have arisen in case of the acceptance of the Harvey plates, since with these latter plates a correction of the curvature is impossible after the carbonizing process, and every treatment on the outside is accompanied by the greatest difficulties." There is something in the common-sense sound of this paragraph that may commend itself, though incidentally we may notice that it is not the carbonizing process that affects the curvature, but the water process. There is trouble with very hard-faced plates. This is not in attaching them to the ship's side, as reported from America, seeing that the back is softer rather than harder than in untreated plates; the trouble is in attaching anything to the outside of the armor, if necessary. It is a mistake, however, we think, to wonder or raise too serious an objection to such a difficulty, which may perhaps be met in more than one way. In spite of contradictory results occasionally obtained, the Harvey plates have obtained a series of such remarkable results that only those who are unacquainted with them would sit down and contentedly reject them at the present time.

GUNPOWDER AND EXPLOSIVES.

NEW SMOKELESS POWDER.—The United States Smokeless Powder Company, of San Francisco, has recently patented in the United States and abroad a new smokeless powder, composed of ammonium bichromate, potassium or sodium picrate, and ammonium picrate. These ingredients are mixed in the proportion of about 20 parts by weight of ammonium bichromate, 25 parts of potassium picrate, and 55 parts of ammonium picrate. In compounding this

powder, the potassium picrate is first ground in a moist condition until it is sufficiently fine for the purpose. The ammonium bichromate and ammonium picrate are ground separately and mixed, in a sufficiently damp condition, until they are thoroughly incorporated. The potassium picrate is then incorporated with the other ingredients in any suitable form of powder-mill. When the mass has been sufficiently mixed it is placed in a hydrostatic press and worked into cakes, which are then broken up and granulated as with ordinary black powder. After granulation the powder is dried at a temperature between 100° and 125° Fahr.—*Arms and Explosives* (chiefly).

SCHNEBELITE: REMARKS.—Schnebelite has attracted considerable attention lately, and has received a good deal of gratuitous advertising from the newspapers. Great claims have been made for it, and to a limited extent these claims have been substantiated on trial, It is a potassium chlorate powder and "is made by dissolving potassium chlorate ($KClO_3$) in boiling water, in the proportion of 6 to 10, then adding elder pich (a comparatively pure form of cellulose) ground fine, and lastly starch paste sufficient to form a consistent mixture. This is then laminated and allowed to dry, when it is broken up into powder."

Arms and Explosives calls attention to the fact that the safety of the powder under all conditions has not yet been demonstrated. All potassium chlorate mixtures hitherto devised have been found to be very sensitive to shock and to heat, and to gradually disintegrate when stored or exposed in contact with any easily oxidizable substance. Storage greatly increases the danger of handling chlorate mixtures. The affinity of the oxygen for the base seems to be weakened, and the former is suddenly given up when the slightest shock is received. It is chiefly due to this peculiarity of potassium chlorate and potassium chlorate mixtures that *Arms and Explosives* makes the statement that Schnebelite has not yet shown itself to be a safe explosive under all conditions. It is manifest that under ordinary conditions of storage in magazines on shore or on ship-board, the temperature and hygrometric conditions will vary within rather wide limits. So that until Schnebelite has passed these tests it ought not to be regarded as a safe explosive adapted to military, naval, and other purposes. It is understood that tests are now being made by competent authorities.

L. S. VAN DUZER,
Lieutenant U.S.N.

PHILIP ANDREWS,
Ensign U.S.N.

SERVICE SALAD.

Saratoga Day.

IT is singular that the Empire State, within whose bounds took place many of the most important events, military and civil, of the Revolution, should never have commemorated any one of them by setting aside its anniversary as a public holiday.

Massachusetts has long set her a good example by observing the anniversary of Bunker Hill—June 17—as a holiday. And now, in place of the obsolete Fast Day, the 19th of April has been created a holiday. No official designation has been given it, but the suggestion of "Patriots' Day," as the joint anniversary of the memorable events at Lexington and Concord, meets such general approval that its adoption is almost certain.

We are glad to be able to state that the memory of this event (Burgoyne's surrender to Gates, October 17, 1777) is to be perpetuated by its anniversary being made a holiday under the style of "Saratoga Day," if the next Legislature shall pass the bill to that effect which will be presented early in the session. It would have been introduced last winter but for the absence, through illness, of the senator desired as its sponsor. Preliminary inquiry and effort on its behalf among historical and patriotic societies shows an encouraging sentiment in favor of the proposition. Favorable action has already been taken by THE SONS OF THE AMERICAN REVOLUTION, and THE SONS OF THE REVOLUTION will consider a resolution in its favor at their managers' next meeting, October 9. The *United Service Magazine* has warmly approved the plan, as have also various newspapers.

The event itself has always been recognized by historians as having a vital bearing upon the fortunes of the patriots in 1777. Had the plan of Burgoyne's campaign—to effect a junction with Howe's army, with or without previous union with St. Leger's force—succeeded, the resultant British control of the Hudson would probably have crippled the patriot cause. New England, thus separated from the other colonies, might have been crushed while Washington was powerless to help her. Then the subjugation of New York would have inevitably followed, and the whole of our national history been unwritten. To quote from Geo. Wm. Curtis: "But as, gratefully acknowledging the service of all the patriots, we yet call Washington father, so, mindful of the value of every event, we may agree that the defeat of Burgoyne determined American Independence. Thenceforth it was but a question of time. It was the surrender of Burgoyne that determined the French alliance, and the French Alliance secured the final triumph."

The scanty list of holidays in New York State now contains only one, Labor Day, between the Fourth of July and Thanksgiving Day. Thus "Saratoga Day" would occur in a month where now is none. It would be an eminently appropriate holiday, commemorating not alone the great event, but the share had in it by the troops of New York. Three regiments of New York Continentals—James and Henry Livingston's (the "Additional Continentals" and the Fourth), Philip Van Cortlandt's (the Second), and three thousand New York militia under General Ten Broeck—helped to defeat Burgoyne's veterans in the two encounters on Bemis's Heights. Should not the memory of the surrender, in consequence, of the first British army to a patriot force be fixed in the minds of future generations by the enactment

of the 17th of October, from 1895 onward, as SARATOGA DAY.

Gettysburg.

(*From the New York Independent.*)

I.

UPON a weather-beaten ledge
There stood some cedar trees,
And wavering across the edge
Flew butterflies and bees;
White clover to the ridges clung
That led to busy mills
The gathered waters caught among
The silence of the hills;
The orchard yonder lifts to view
Each bough with blossom rife,
Where spring with patient hand anew
Had wrought its work of life;
And school-boys search with eager look
The thicket's deepest shade,
To mark anew the cherished nook
Where tiny eggs were laid;
Across the field together fared
A lad and lass,—each face,
Though homeward set, alike declared
The fields the sweetest place;
And cattle loiter down the lane
Or in the sedges wait,
While careless milkmaids call in vain
And gossip by the gate;
The sun sank low upon the sky
And lower yet, until
He tipped with light the tombs that lie
On Cemetery Hill.
Do winds that wander there alone
Gray vapors wrap about each stone?
Or rise those shades to mighty tread
Of armies thronging overhead?

From trailing clouds of dust emerge
Long files of stalwart men,
And steadily their way they urge
Through meadow and through glen.
There down the mountains in the west
March veterans in gray,
Whose feet the envied sod had pressed
Where Susquehanna lay;
Here out of eastern valleys stream
The volunteers in blue,
Who would those evil days redeem,
The Rappahannock knew!
The empty cannon rattle by,
Brigade and troop have gone,
With crowded wagons hooded high
In canvas closely drawn,
By day the narrow roads they fill
And country side control,
Where woods prolong the bugle trill
For that of oriole,
And fearful children hide the while
Behind the cottage door,
As women view with frown or smile
The soldiers forward pour.
So nearer through each ardent noon
The noisy columns close,
And nearer 'neath a sober moon
Their silent ranks repose,
While sentries watch the ancient wain
That trundles round the polar plain,
Or start to hear a jealous snake
Go rustling through some tangled brake.

II.

The winds of morning slowly streak
Green forests with the breath
Of angry rifles, as they speak
Their messages of death;
And wounded horsemen, reeling, fall
Beside the frightened steed,
As squadrons wheel at trumpet call
Where starry guidons lead.
The echoes ring through field and glade
Where weary troops delay;
Perhaps reclining in the shade
To watch in restless play
Pale aspen leaves, and think the while
Of hearts that far away
The time with ready hopes beguile,
Or wildly beat before
The list of dead and wounded sent
So oft from door to door,—
If these some humble name lament
Though none to them so dear,
Those too a dawning smile repent
And listen still with fear;
Or here perhaps the men beset
Some roadside sweep and well
And watch the waters sparkling yet
Where erst the bucket fell,
Still watching on the mosses wet
The ripples sink and swell,—
But through the plash from dripping stones
The rattle breaks of hostile guns,
And onward there from rear to van
Are hastening now each horse and man.

III.

The wind of morning gayly plays
About a smiling slope,
From which invading thousands gaze
Irradiate with hope.
The steep beyond, where grimly frowned
A front of men and rock,
The Union colors now have crowned,
Nor dread the threatened shock.
But over Northern hearts there flies
What Southern hands should spare,—
The flag that flamed upon her skies
When Pakenham was there;
The flag that shook to Moultrie's cheer,
With British ships abreast;
The flag her valor helped to rear
'Neath Orizaba's crest.
In glory over foreign seas
Ye bore each youthful fold,
Floats it less proudly on the breeze
To-day than once of old?
Its stars are more,—as bright they seem,
Its glow as deep appears
As when Decatur's guns redeem
The captives of Algiers——
The sod below the orchard boughs
A blush of deeper dye
Shall wear when those no hate can rouse
Beside each other lie.
And if the spot should nameless be,
Some reaper may hereafter see
The bearded wheat with strange increase,
And breathe for all a wish of peace.

IV.

The winds of morning hurry o'er
The batteries below,
Nor stay to gather up the roar
From hostile slopes aglow
With bounding shot and riven shell,
Amid whose fiery tide,
With musket ready to repel,
The infantry abide.
The cannon did what cannon could,
Their thunders cease; and then
From out the shelter of the wood
Came Pickett and his men.
Unflinchingly they onward press
Against the savage hail,
The living ever growing less
Along the ghastly trail.
They mount the ridge, its brow they claim,
No men can farther go;
They sink like reeds within the flame,
The gales of autumn blow,
And then the darkness comes to spread
Impartially its pall
Above the unresisting dead
And mourn alike for all.
The dews descending on the grass
Remove a foreign stain,
But homes by which broad rivers pass
Disconsolate remain.
For many hearths some loving soul
Sent forth at call of battle-roll,—
To many hearths return is made
Of coffined hopes and rusted blade.

V.

Against the level shafts of light
That on the summit shine
Gray mists climb up a craggy height
And hang by oak and pine;
But, backward rolled, together cling
In dripping shadow hid,
Until the sunbeams downward spring,
The sullen mass amid.
It melts away, dissolving slow
In azure depths withdrawn,
Revealing freshened breadths below
Of wilderness and lawn;
And wider yet unfolds the plain
In radiance new-born,
Of waving fields of amber grain
And purple-spired corn.
A brook by arching willows crossed
The pebbled shallow cools,
And then, from mossy ledges tossed,
Is caught in crystal pools,
Where lovers timidly escape
From peering eyes afar,
To watch the faithful waters shape
Anew the evening star.
So ever struggles night with day,
And forms of gloom arise,
To only fade beneath the ray
That pierces crimson skies.
So trees are rocked to greener life
When winds go by in angry strife;
Though Ætna's ashes were its tomb
Each field comes forth in brighter bloom;
As from the ruin war could make
Again shall vine and olive break.

Colonel Henry W. Closson.

"TRILBY" is one of the books, of which there are not many, which make a practical critic pause in the exercise of his craft, partly because it has got beyond him before it comes before him, and partly because he is not certain that he will not be able to take an unbiased view of it. Before Mr. Du Maurier wrote "Peter Ibbetson," three or four years ago, he was known among other clever draughtsmen as a constant and favorite contributor to *Punch*, and his work was admired for its satiric realizations, or idealizations, of certain social phases of English life, but no literary element attached to it, for at its best it was purely pictorial. One day, however, Mr. Du Maurier made up his mind that he could use the pen as well as the pencil, and suddenly, as Waller said of Denham, he broke out, like the Irish rebellion, forty thousand strong, in "Peter Ibbetson." It was a great surprise, and a great triumph on that account, for the unexpected, when it happens, always reveals something besides itself. It revealed, in the case of Mr. Du Maurier, a man who without training displayed great qualities as a writer, and who was accordingly hailed as a great writer, which he was not, and is not yet, though he is in many respects a remarkable and in some respects an original one. He is not literary, in the labored way that Mrs. Humphry Ward is, and we are glad of it; he is not literary in the equally-labored but more fantastic way that Mr. George Meredith is, and we are still more glad of it, for we are heartily tired of Mr. Meredith's manifold affectations. He has a fresh, natural, unstudied manner of his own, but, critically speaking, he has not attained style, as he, with his exquisite taste in art, must be fully aware, more aware than many of his enthusiastic eulogists, mostly of American extraction, who profess to consider him the superior of Thackeray. Where he is admirable, and that is in his sketches of art and studio life in Paris, he reminds us of the creator of Clive Newcome and his merry comrades, and when we say that the early chapters of "Trilby" remind us of certain chapters of "The Newcomes," we say all that need be said. They are like, but different, the difference being in favor of Thackeray, whose pencil was more chary in depicting the license of student life than that of Mr. Du Maurier, who is rather a humorist than a satirist, though a hearty and healthy one, in spite of the riotous life which he describes so frankly and freely. The world of art is large enough to include Mr. Du Maurier's Bohemia, which is thoughtless rather than evil. One would not care to live in it always, but one could live in it pleasantly when one is young, with Little Billee and his two friends, and with their friends, careless livers and loose fish as they are. And Trilby? What shall we say of Trilby? She is as perfect, in her imperfect way, as one of Shakespeare's women,—a light, merry, original, reckless, tender-hearted, loving, noble creature. Given her heredity, her childhood, her ignorance, her surroundings, her profession as a model for "the altogether," as she translates it, she might have been worse, but she could not ever have been other than she was, with her beauty, her majesty, and her unconscious genius for singing, which only a demon like Svengali was able to detect and develop, mastering her life, but not her soul, by some supernatural power, mesmerism, hypnotism, or what not. To have created a woman like Trilby is a proof of genius which we feel without being able to understand it, it is so powerful, so original, and so inevitable. Mr. Du Maurier has taken his place among the masters of fiction with "Trilby."—From the *New York Sun*.

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MILITARY ORDER OF THE LOYAL LEGION OF THE UNITED STATES.

Companions of the Loyal Legion are invited to contribute to this department. News of the Commanderies is always welcome, but suggestions likely to inure to the benefit of the whole organization are of higher value, and therefore particularly desired. The pages of the Loyal Legion Department of the "United Service" are always at the service of members of the Order desiring to discuss matters of general interest to their comrades of the Military Order of the Loyal Legion.

California Commandery.

To THE FIRST CLASS (by succession).—William Evelyn Hopkins, Jr., consequent upon the death of companion William Evelyn Hopkins, Commodore U.S.N. (retired). No. 909, Commandery of California, Insignia No. 8870.

Wisconsin Commandery.

Stated meeting held November 7, 1894.

To THE FIRST CLASS.—Lieutenant-Colonel Hiram Hayes, U.S.V.; Lieutenant George Washington Bird, U.S.V.

Illinois Commandery.

Stated meeting held November 8, 1894.

To THE FIRST CLASS.—Captain David Milton Lyon, U.S.V.

To THE FIRST CLASS (by inheritance).—George Turnley Dyer, Charles William Nugent, John Mortimer Stiles.

To THE SECOND CLASS.—William Thompson Hapeman, Daniel Pancoast Kidder, Nathaniel Lord.

District of Columbia Commandery.

Stated meeting held November 7, 1894.

To THE FIRST CLASS (original).—Captain George Franklin Foote, U.S.A.; First Lieutenant Lemon Galpin Hine, U.S.V.; Chief-Engineer Daniel Paul McCartney, U.S.N.; First Lieutenant Aven Pearson, U.S.V.

To THE FIRST CLASS (by inheritance).—Major Philip Francis Harvey, U.S.A.; Mr. Robert Montgomery Thornburgh.

To THE SECOND CLASS.—First Lieutenant Tracy Campbell Dickson, U.S.A.

Minnesota Commandery.

Stated meeting held November 13, 1894.

To THE FIRST CLASS.—Captain Wm. Henry Harries, U.S.V.; Assistant Surgeon David Riland Greenlee, U.S.V.

PRESENT MEMBERSHIP.

First class (original)	253
First class (by succession)	4
First class (by inheritance)	30
Second class	24
Third class	3

At a stated meeting of this Commandery, held October 9, 1894, the following resolution, passed by the Pennsylvania Commandery, was unanimously adopted:

"*Resolved*, That it is the sense of the Commandery that Companions of the Military Order of the Loyal Legion of the United States should always salute or otherwise recognize each other when wearing the insignia or rosette of the order."

Ex-Commander Brevet Brigadier-General E. C. Mason, U.S.A., presented the Commandery with a handsome gavel, made from the first flag-staff erected at Fort Snelling, in 1819.

Vermont Commandery.

Stated meeting held September 11, 1894.

To THE FIRST CLASS.—Colonel Dudley K. Andross, U.S.V.

To THE SECOND CLASS.—James F. Hooker.

TRANSFERS.

New York Commandery.

Acting Rear-Admiral Lester A. Beardslee, U.S.N., to California Commandery.

California Commandery.

Pay-Inspector George Armstrong Lyon, U.S.N., and Admiral George Eugene Belknap, U.S.N. to Massachusetts Commandery; Major Charles Irving Wilson, Paymaster U.S.A., and Colonel David Stuart Gordon, U.S.A., to District of Columbia Commandery.

Michigan Commandery.

Colonel Henry B. Bristol, U.S.A., to New York Commandery.

NECROLOGY.

California Commandery.

Acting Master William Bangs Cobb, U.S.N., October 9, 1894, at San Francisco, Cal.; Acting Master Nigel D'Oyly, U.S.N., October 7, 1894, at San José, Cal.; Commodore Wm. Evelyn Hopkins, U.S.N., October 24, 1894, at San Rafael, Cal.

Illinois Commandery.

First Lieutenant Joseph Phelps Card, October 22, 1894, at Englewood, Ill.; Mr. William Edward Clarke, Jr., October 6, 1894, at Chicago, Ill.; Brevet Major William Merritt Luff, October 9, 1894, at Fort Meade, S.D.

Michigan Commandery.

Major and Surgeon Henry F. Lyster, October 8, 1894, at Niles, Mich.

IMITATION ROSETTES.—The following communication was received by Captain A. Ross Houston, recorder of Wisconsin Commandery:

MILITARY ORDER OF THE LOYAL LEGION OF THE UNITED STATES.

COMMANDERY-IN-CHIEF,
PHILADELPHIA, October 10, 1894.

CAPTAIN A. ROSS HOUSTON, *Recorder:*

DEAR SIR AND COMPANION,—At our meeting of the Commandery-in-Chief to-day General Fairchild came in wearing an imitation rosette of the Loyal Legion. My attention was at once called to it, and, upon inquiry, I learned from him that he received the same from some one in your Commandery. He says he never purchased any, so that he could not have picked it up in any store. This rosette is made in Vienna, as stamped on the back, and, although not exactly like ours in the size of the sectors, it is still such a perfect imitation as to deceive most anybody, and is therefore an infringement upon the patent held by the Commandery-in-Chief.

Will you please look into the matter, and see if you can trace up whence they came and who has them, and please report to me.

Very truly yours,

P. D. KEYSER,
Chancellor-in-Chief.

THE UNITED SERVICE

A MONTHLY REVIEW OF

MILITARY AND NAVAL AFFAIRS.

NEW SERIES.

VOL. XII.—DECEMBER, 1894.—No. 6.

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A HUNDRED YEARS AGO,

In a quaint old English inn located in the heart of London, at a table beer-stained and aged, sat two very curious-looking characters, playing at cards.

One was rough, unclean, shabby, and much the worse for wear—Martin by name. The other, poor in appearances, was, however, neat, refined, and attractive; one whose genius we admire, whose wit always refreshes us, and whose character we love for its unselfishness. It was Charles Lamb.

The two men played, and played, and played long into the night, and while beer and something stronger found its willing course down their ever-thirsty throats, Lamb kept up his accustomed broadside of wit. The night passed into the early morning, and yet they played. Luck kept favoring Lamb, when towards the close of their game, seized with a bright idea, and the consciousness of the dirt which the morning light seemed to reveal more clearly in the appearance of his companion, he said, "Martin, if dirt was trumps, what hands you would hold!"

The parting thrust was rich wit, to be enjoyed as long as Lamb is remembered. But Lamb thought of more than what appeared on the face of his remark. He referred also to a topic or agitation which was the prevailing one of the day, personal cleanliness, put into motion by the advertising of a new household luxury, not long before invented, and which, owing to its great worth and superiority, had become immensely popular, attracting the notice of every one.

It was patronized by royalty, enjoyed by the nobility, sought for by the fastidious. It was inspiration to the poet, and he sang of it; it was on the tongue's end of the wit, and he made puns of it; it was the delight of the moralist, and he preached of it; it was the occupation of the scientist, and he wondered at it. It was the talk of the day; every one knew of it, every one liked it, every one used it.

Then Time took it in hand, and hours turned to days, days to weeks, weeks to months, and months to years, years to tens and twenties and fifties, till a century passed, and still it multiplied in popularity. The envious hurled imitations at its head, the chemist thought, man came and went, but still its popularity extended, until to-day there is not a town or village or city that doesn't use Pears' soap, and largely.

Lamb felt a hundred years ago that to be clean in the true sense of enjoying cleanliness it was necessary to use Pears' soap, not because it was soap, but because it was PEARS' soap. For Pears' soap brought to the user a new sensation, a feeling of cleanliness, a freshness, a purity, a softening to the skin which was not known before. Every user of Pears' soap to-day feels as Lamb did a hundred years ago.

Yet how careless some are about the use of soap. The quality of soap used makes all the difference in the world to the skin. You may lather and soap your body with some hard substance called soap, which is about as dirty as the dirt it pretends to take off, but that isn't cleaning the body, that isn't removing the dirt and leaving the skin white, clean, pure, and soft, giving Nature a chance to throw off all impurities.

Pears' soap doesn't leave the skin rough and chapped. Pears' soap leaves the complexion fair to look upon. It improves most complexions. The success of Pears' soap is no secret. Any one who uses Pears' soap can tell you what is pure soap, and why it is so popular. Pears' soap advances with civilization, or rather civilization with Pears' soap. Cleanliness always betokens refinement. Even look with what care the birds wash themselves and put their plumage in order, and how clean and elegant they appear. Among the beasts of the forest or field, the most contented, the most cheerful, the most happy are the ones most cleanly. And so great is the effect of cleanliness upon man that it extends to his moral character. Virtue cannot dwell long where there is filth, nor can a person attentive to cleanliness be a villain. And so for more than a hundred years has the human race been uplifted, both physically and morally, by PEARS' soap. Pears' is the name for pure soap. It wears to the thinness of a wafer and is matchless for the complexion. Others may be good, but Pears' is best.

KNOWLEDGE

brings comfort and improvement, and tends to personal enjoyment, when rightly used. The many, who live better than others and enjoy life more, with less expenditure, by more promptly adapting the world's best products to the needs of physical being, will attest the value to health of the pure liquid laxative principles embraced in the remedy

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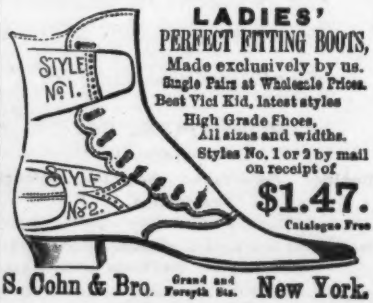

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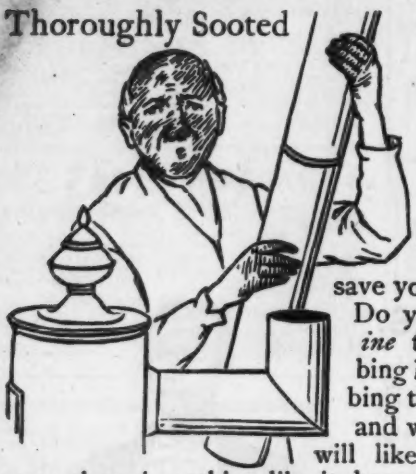

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